Service Manual
ASM 3.1 -F1
F1-25 through -101

Catalog 9129 8220-02
October 2003, GB

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F1

The F1 series offers many additional values for operators of cargo cranes, container lifts, skip loaders, forest cranes, concrete mixers and similar truck applications.

Series F1 is a very efficient and straight forward pump design with unsurpassed reliability. Its small envelope size makes for a simple and inexpensive installation requiring a minimum of piping.

F1-25/-41/-51/-61.

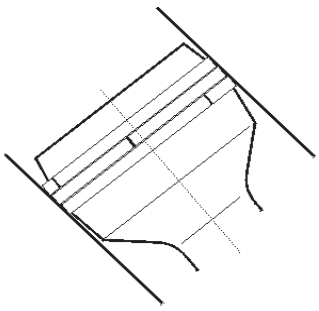
New features of the F1 are:

- Higher selfpriming speeds
- Max operating pressure 400 bar
- New frame sizes to meet market requirements
- Higher overall efficiency
- Increased reliability
- Reduced noise level
- Possible leakage paths reduced
- Easier to change direction of rotation
- Smaller installation dimensions

F1-81/-101.

... thanks to:

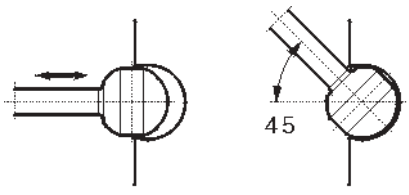
- 45° bent-axis angle
- Optimal inlet port geometry
- New ball and roller bearings
- Single housing design



F1 piston with piston rings.

All of this in addition to previous features:

- Spherical pistons - high speeds
- Laminated piston rings - low leakage
- Positive synchronization with timing gear
- Installation above the reservoir level possible
- Tolerates low tempertures and high temperture shocks
- Shaft end and mounting flange meet the ISO standard



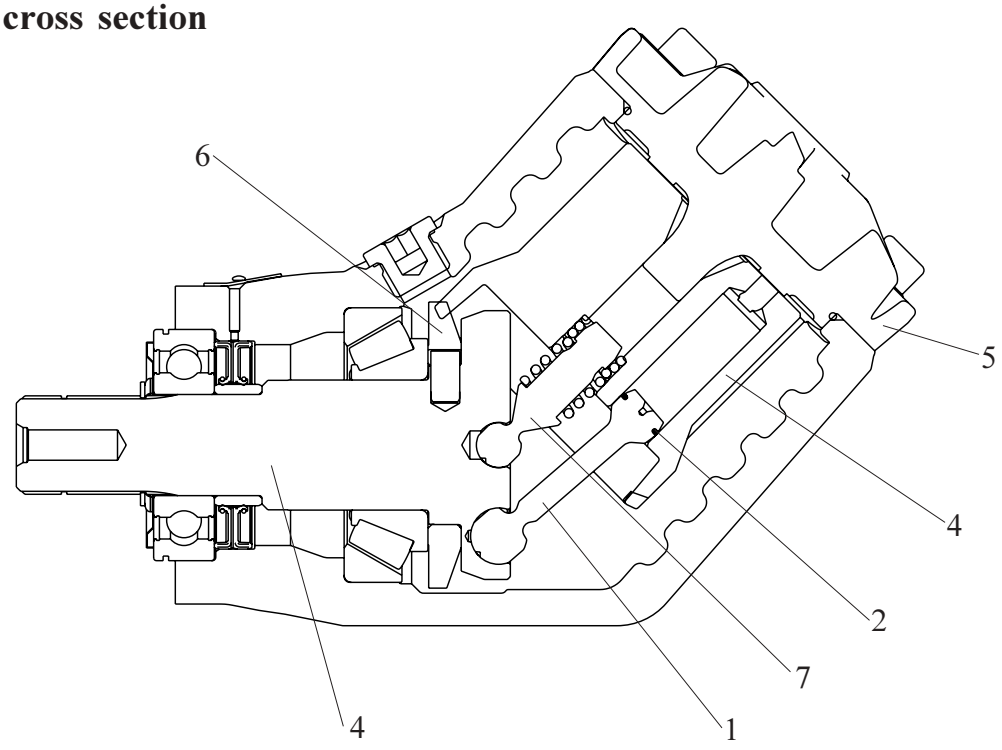
F1 piston-to-shaft locking.

F1 frame size	25	41	51	61	81	101
Displacement [cm³/rev]	25,6	40,9	51,1	59,5	81,6	102,9
Max flow 1) [l/min]						
at 350 bar	67	98	112	131	163 2)	185 2)
at 400 bar	56	86	97	113	143	160
Max operating pressure [bar]						
continuous	350	—	—	—	—	350
intermittent	400	—	—	—	—	400
Shaft speed [rpm]						
- short circuited pump (low press.)	2700	2700	2700	2700	2300	2300
- max speed at 350 bar 1)	2600	2400	2200	2200	2000 2)	1800 2)
at 400 bar 1)	2200	2100	1900	1900	1750	1550 2)
Torque [Nm]						
at 350 bar	142	227	284	331	453	572
at 400 bar	163	260	324	378	518	653
Input power [kW]						
- intermittent	39	57	66	76	95	108
- continuous	31	46	52	61	76	86
Weight [kg]	8.5	8.5	8.5	8.5	12.5	12.5

1) Valid at an inlet pressure of 1.0 bar (abs.) when operating on mineral oil at a viscosity of 30 mm²/s (cSt).

2) Valid with $2^1/_2$" inlet (suction) line.
With 2" suction line: F1-81 – max 1800 rpm (Q ³140 l/min);
F1-101 – max 1400 rpm (Q ³140 l/min).

Pump cross section



Design and function

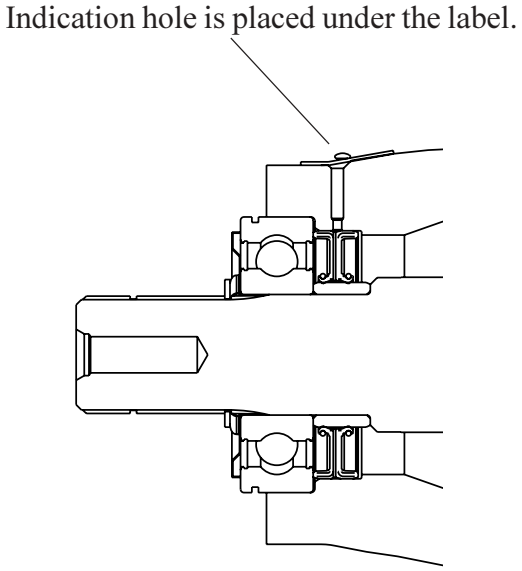
F1 is a piston pump with spherical pistons (1) including piston rings (2). The pistons are working at the angle of 45° to the shaft (3). When the shaft rotates, the pistons move up and down in the cylinder barrel (4), forcing the oil to pass from the inlet port to the onlet in the end cap (5). A ring gear (6) connects the cylinder barrel to the drive shaft, causing these to rotate at the same speed.

A barrel support (7) with a spring presses the cylinder barrel against the end cap. An internal connection from the housing to the suction port eliminates a separate drain line to the tank. F1 is provided with shaft and connection flange that fits direct to PTO´s with ZF standard.

Check of Shaft Seal and seal towards PTO

The shaft seal, seals towards the hydraulic oil in the barrel housing and towards the oil in the PTO. The ball bearing is also protected with a protective washer, assebled outside the ball bearing.
If there is a leakage either from the PTO or from the barrel housing, the oil will come out through the indication hole.

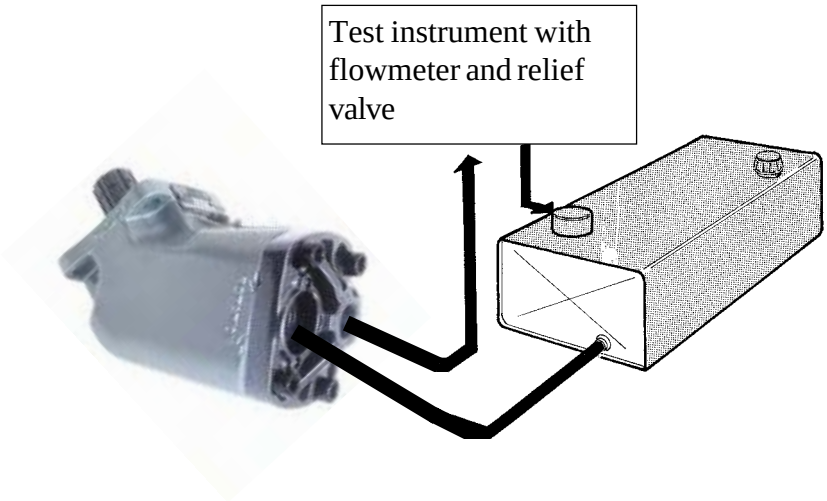
Check that no oil is dripping out of the indication hole, when the pump is in operation. If there is a leakage from the shaft seal, it must be exchanged.



Note: A heavy leakage can be caused by a worn-out pump, wherby high pressure oil will come out into the housing in such large quantities that the seal ring might be damaged. If there is a steady stream of oil from the indication hole, the pump is probably damaged and will have to be replaced or repaired.

Checking the flow from the pump

The flow from the pump can be checked by means of a test instrument comprising a flowmeter and a relief valve.

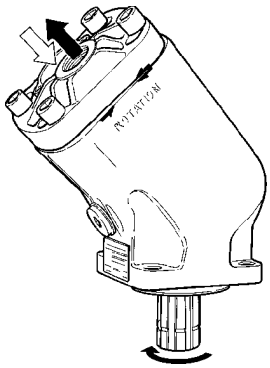


When the pump is running at about 800 - 1400 rpm and is loaded up to 150 - 200 bar, the flow must not decrease by more than 10%.

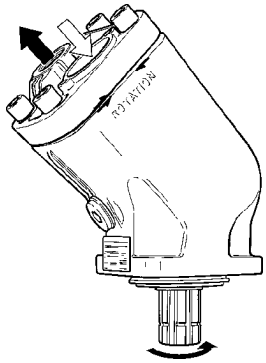
Example: An F01-041 running at 1225 rpm gives - according to the flowmeter - a flow of 48 l / min. If the pump is loaded, the flow must not decrease by more than 0,1 * 48 = 4,8 l / min, i.e. the flowmeter should indicated at least 48 - 4,8 = 43,2 l / min. If the flow decrease more than 4,8 l / min the pump is damaged and have to be replaced or repaired.

The table below shows minimum flow at 1000 rpm and 150 - 200 bar pressure.

Size	Rpm	Min. flow (l / min)
F01-025	1000	21,6
F01-041	1000	34,2
F01-051	1000	44,1
F01-061	1000	54,9
F01-081	1000	72,0
F01-101	1000	88,2



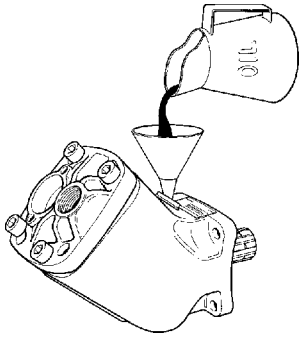
Left hand rotation



Right hand rotation

Direction of rotation

The factory assembled direction of rotation, appears on the label and by arrows on the material. (R=Right L=Left)
The pictures above show direction of flow vs. shaft rotation. The direction of rotation can be changed (i.e. from right hand to left hand) by turning the end cap.
Remove the four cap screws and turn the end cap about half a turn while making sure it stays in contact with the barrel housing.
Re-fit the cap screws and torque to 90 ± 10 Nm.



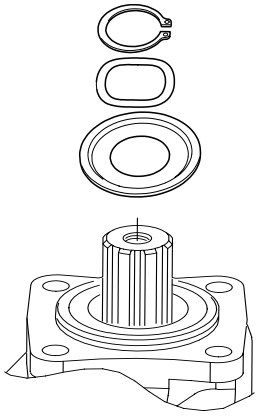
Before start-up, the housing must be filled with hydraulic fluid.

Start-up

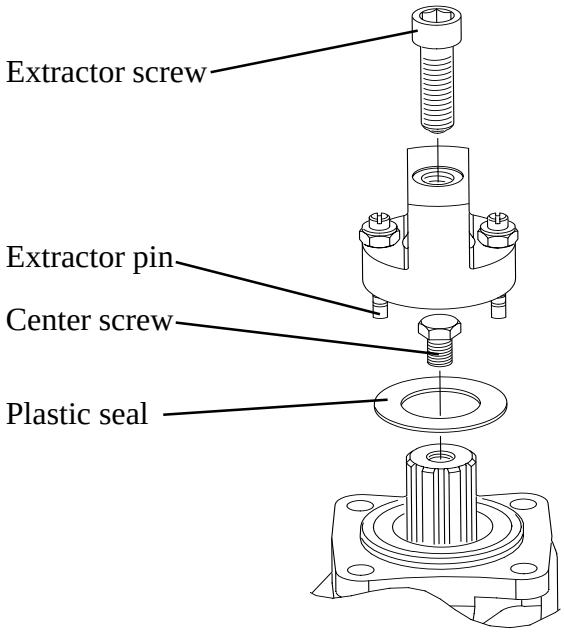
Make sure the entire hydraulic system is clean before filling it with a recommended hydraulic fluid.
In particular, make sure the pump is filled (to at least 50%) by connecting the suction hose and undo the hexagon plug until oil appears.
Torque the hexagon plug to 30 ± 5 Nm.

Disassembling

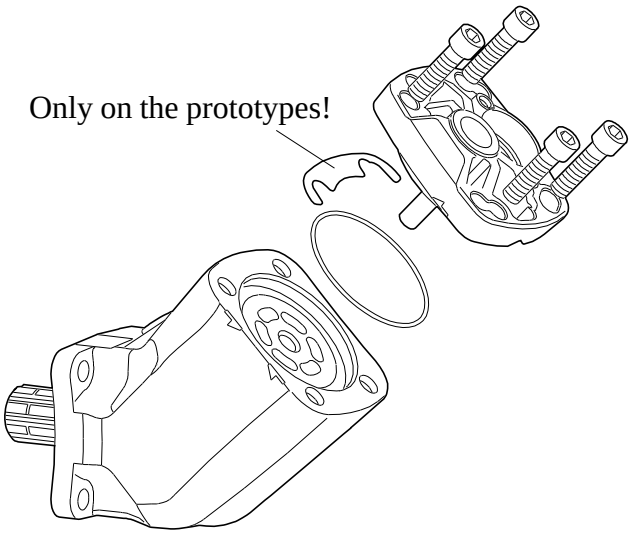
1.
Fasten the barrel housing in a vice with the shaft upwards.



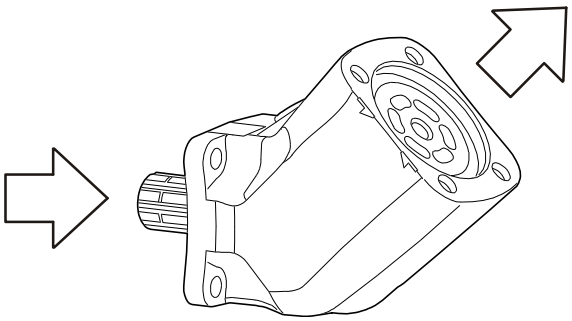
2.
Disassemble the retaining ring (item 465), the waved spring washer (item 238) and the protective washer (item 236).



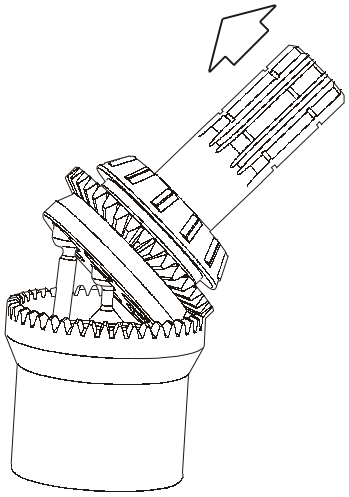
3.
Disassemble the plastic seal fitted on the roller bearing and fasten the center screw a couple of turns. Take the mandrel which comes with the disassembling,- reassembling tool and deform the ball cage until it is possible to turn the mandrel 90°, down in the ball cage. Place the tool over the shaft end with the extractor pins inserted in the bearing. Turn the extractor pins 90° and screw the extractor screw down until the bearing comes loose. Remove the O-ring which is fitted under the bearing.



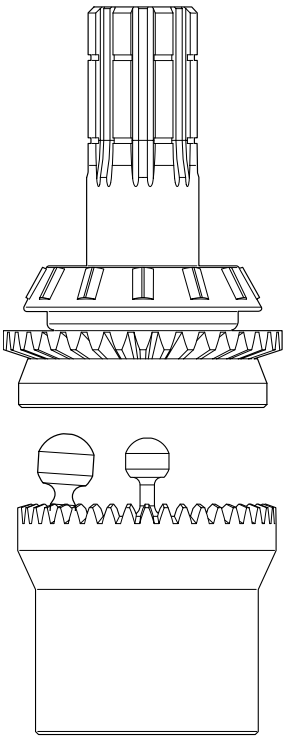
4.
Disassemble the end cap.



5.
Take out the shaft, the pistons, the barrel support and the cylinder barrel from the barrel housing. Disassemble the cassette seal from the barrel housing.

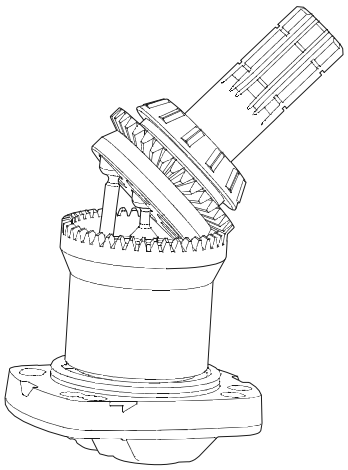


6.
Angle the shaft up and disassemble it together with pistons and barrel support. The barrel support is kept in position in the barrel with a snap function.

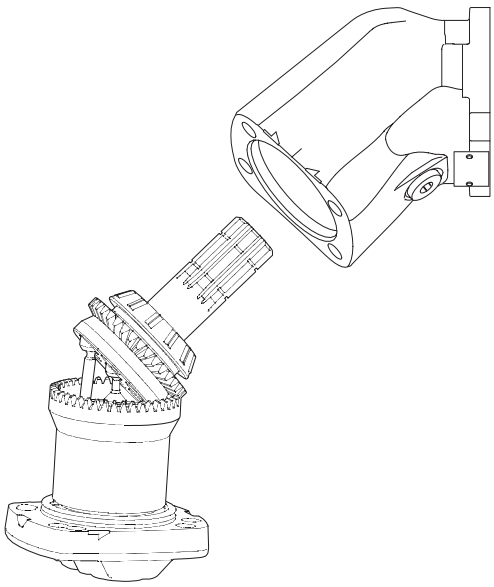


Assembling

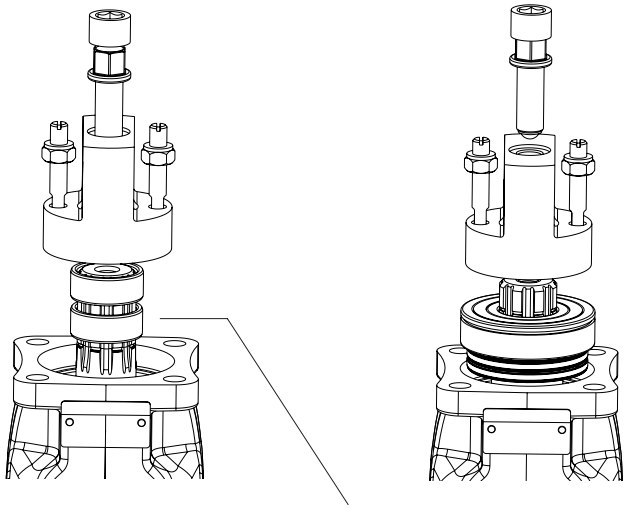
1.
Fasten the end cap in a vice with the center shaft upwards.



2.
Place the pistons and the barrel support in the cylinder barrel. Place the shaft over the pistons and on the barrel support. Turn the package 180° and shake down the pistons into the piston holes in the shaft, then angle 45°. Turn the package back and reassemble the cylinder barrel on the end cap. Ensure correct timing. (Marking, punch mark)



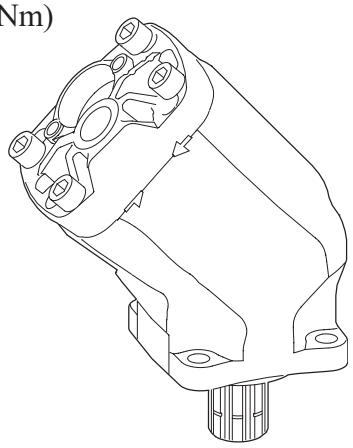
3.
Reassemble the barrel housing. Ensure correct rotation. Tighten at least two screws. Check the timing by rotating the shaft. The timing is easy to check under the purge plugg in the housing.



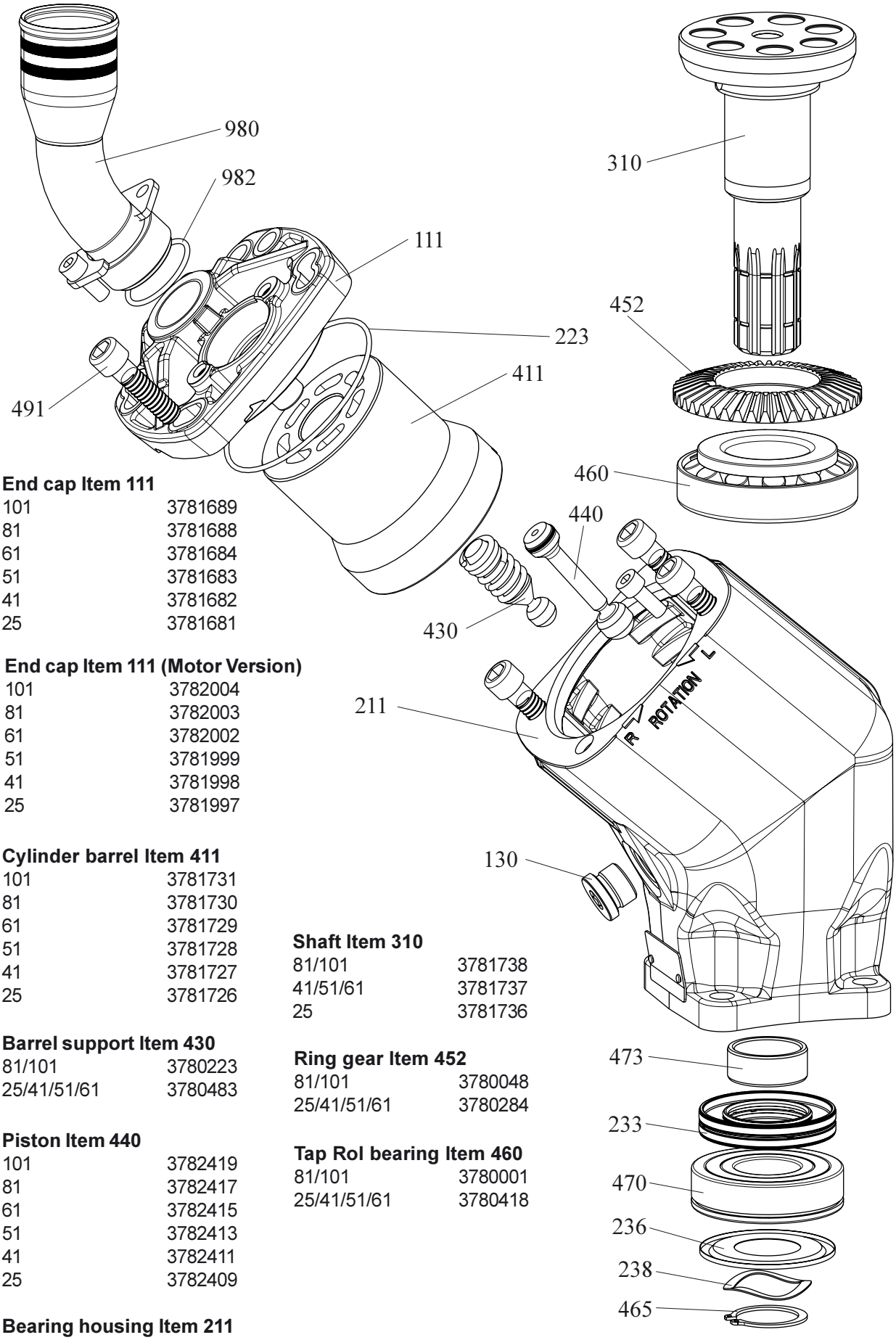
Pressed in two steps.
See below in text!!

4.
Fasten the package in a vice with the shaft end upwards. Place the inner ring on to the shaft. The inner ring is pressed down in two steps. **First step** with the assemble tool alone. **Second step** with assemble tool together with the distance ring to reach final position for the inner ring. Lubricate the outher diameter of the casette seal with hydraulic oil. Place the casette seal together with the bearing on to the shaft. Take the assembly tool and place it on the bearing. Fasten the assembly screw a couple of turns. Pull down the bearing together with casette seal by turning the nut as far as possible. Reassemble the protective washer (item 465), the waved spring washer (item 238) and the retaining ring (item 465) if neccesary (see publ. 1780). Fasten all screws and make sure that correct torque is achieved. (90±10Nm)

Turn the shaft at least on rev. to ensure correct mounting.



Splitview / Spare Parts



End cap Item 111

101	3781689
81	3781688
61	3781684
51	3781683
41	3781682
25	3781681

End cap Item 111 (Motor Version)

101	3782004
81	3782003
61	3782002
51	3781999
41	3781998
25	3781997

Cylinder barrel Item 411

101	3781731
81	3781730
61	3781729
51	3781728
41	3781727
25	3781726

Barrel support Item 430

81/101	3780223
25/41/51/61	3780483

Piston Item 440

101	3782419
81	3782417
61	3782415
51	3782413
41	3782411
25	3782409

Bearing housing Item 211

81/101	3781723
25/41/51/61	3781722

Shaft Item 310

81/101	3781738
41/51/61	3781737
25	3781736

Ring gear Item 452

81/101	3780048
25/41/51/61	3780284

Tap Rol bearing Item 460

81/101	3780001
25/41/51/61	3780418

Spare Part Kits and Tools

Serial No. from 2000200001
Items included in the seal kit for **double** shaft seal.
130, 223, 233, 236, 238,
465, 470, 473, 982.

Unit	Part no.
F1-25, -41, -51, -61, -81, -101, T1-81, -121	3780862

Items included in the Seal Kit for T1-51

130, 227, 228, 233, 241

Unit	Part no.
T1-51	3793572

Items included in the Spare Part Kits for the 5 & 7-piston version.
111, 130, 223, 233, 236, 238, 411, 430, 440, 465, 470, 473, 982.

Unit	Part no.
F1-25	3781844
F1-41	3781845
F1-51	3781846
F1-61	3781847
F1-81	3781848
F1-101	3781849

Items included in the Spare Part Kits for T1.
111, 130, 223, 233, 236, 238, 411, 430, 440, 465, 470, 473, 982.

Unit	Part no.
T1-51	3782809
T1-81	3782807
T1-121	3782808

Detail	Part no.
Disassembling/ Reassembling Tool	3780917

Parts Specification

Item	Description
111	End Cap
130	Hex Socket Plug
211	Bearing Housing
223	O-ring
227	O-ring
228	Gasket
233	Shaft Seal
236	Protective Washer
238	Waved Spring Washer
241	Gasket
310	Shaft
411	Cylinder Barrel
430	Barrel Support
440	Piston
452	Ring Gear
460	Tappered Roller Bearing
465	Retaining Ring
470	Roller Bearing
473	Inner Ring
491	Hex Socket Screw
980	Suction Fitting
982	O-ring

Exchange Units

Unit	Part no.
F1-25	3780856
F1-41	3780857
F1-51	3780858
F1-61	3780859
F1-81	3780860
F1-101	3780861

Note! Not on all markets.

Please contact our sales representative:

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SE-461 82 Trollhättan
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Fax +46 520 371 05
www.parker.com

Catalog 9129 8220-02
October 2003, GB

Kits for F2-053/053,-070/035

To fit	Part No	Title	Benämning	Serialno:
F2-053/053-L	3780317	Spare Parts Kit	Reservdelssats	1997470001
F2-053/053-R	3780318	Spare Parts Kit	Reservdelssats	1997470002
F2-070/035-L	3780320	Spare Parts Kit	Reservdelssats	1997470003
F2-070/035-R	3780319	Spare Parts Kit	Reservdelssats	1997470004

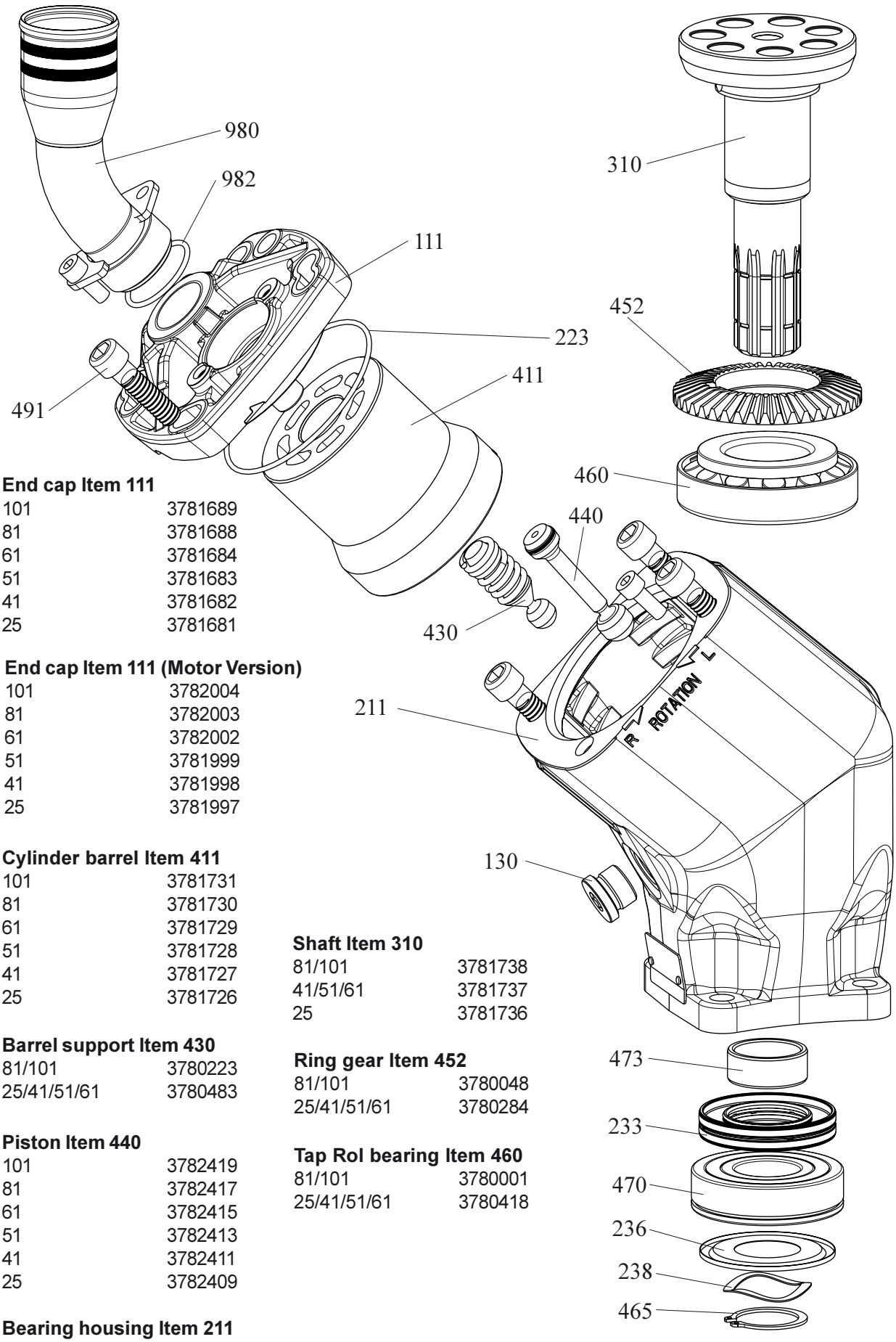
Please refer to ASM 4.1 SI 98/01.

Kits for F2-*plus*-053/053,-070/035

To fit	Part No	Title	Benämning	Serialno:
F2-053/053-L	3781568	Spare Parts Kit	Reservdelssats	2000070001
F2-053/053-R	3781569	Spare Parts Kit	Reservdelssats	2000070001
F2-070/035-L	3781571	Spare Parts Kit	Reservdelssats	2000070001
F2-070/035-R	3781570	Spare Parts Kit	Reservdelssats	2000070001
F2-70/35, 53/53	3783307	Sealing Kit	Tätsats	

The Spare Parts Kits comprise items 110, 227, 228, 233, 411, 440, 443 and 473.
If more parts are required it is normally not profitable to carry out a repair.

Splitview / Spare Parts



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End cap Item 111 (Motor Version)

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Cylinder barrel Item 411

101	3781731
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51	3781728
41	3781727
25	3781726

Barrel support Item 430

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Piston Item 440

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Bearing housing Item 211

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25/41/51/61	3781722

Shaft Item 310

81/101	3781738
41/51/61	3781737
25	3781736

Ring gear Item 452

81/101	3780048
25/41/51/61	3780284

Tap Rol bearing Item 460

81/101	3780001
25/41/51/61	3780418

Spare Part Kits and Tools

Serial No. from 2000200001
Items included in the seal kit for **double** shaft seal.
130, 223, 233, 236, 238,
465, 470, 473, 982.

Unit	Part no.
F1-25, -41, -51, -61, -81, -101, T1-81, -121	3780862

Items included in the Seal Kit for T1-51

130, 227, 228, 233, 241

Unit	Part no.
T1-51	3793572

Items included in the Spare Part Kits for the 5 & 7-piston version.
111, 130, 223, 233, 236, 238, 411, 430, 440, 465, 470, 473, 982.

Unit	Part no.
F1-25	3781844
F1-41	3781845
F1-51	3781846
F1-61	3781847
F1-81	3781848
F1-101	3781849

Items included in the Spare Part Kits for T1.
111, 130, 223, 233, 236, 238, 411, 430, 440, 465, 470, 473, 982.

Unit	Part no.
T1-51	3782809
T1-81	3782807
T1-121	3782808

Detail	Part no.
Disassembling/ Reassembling Tool	3780917

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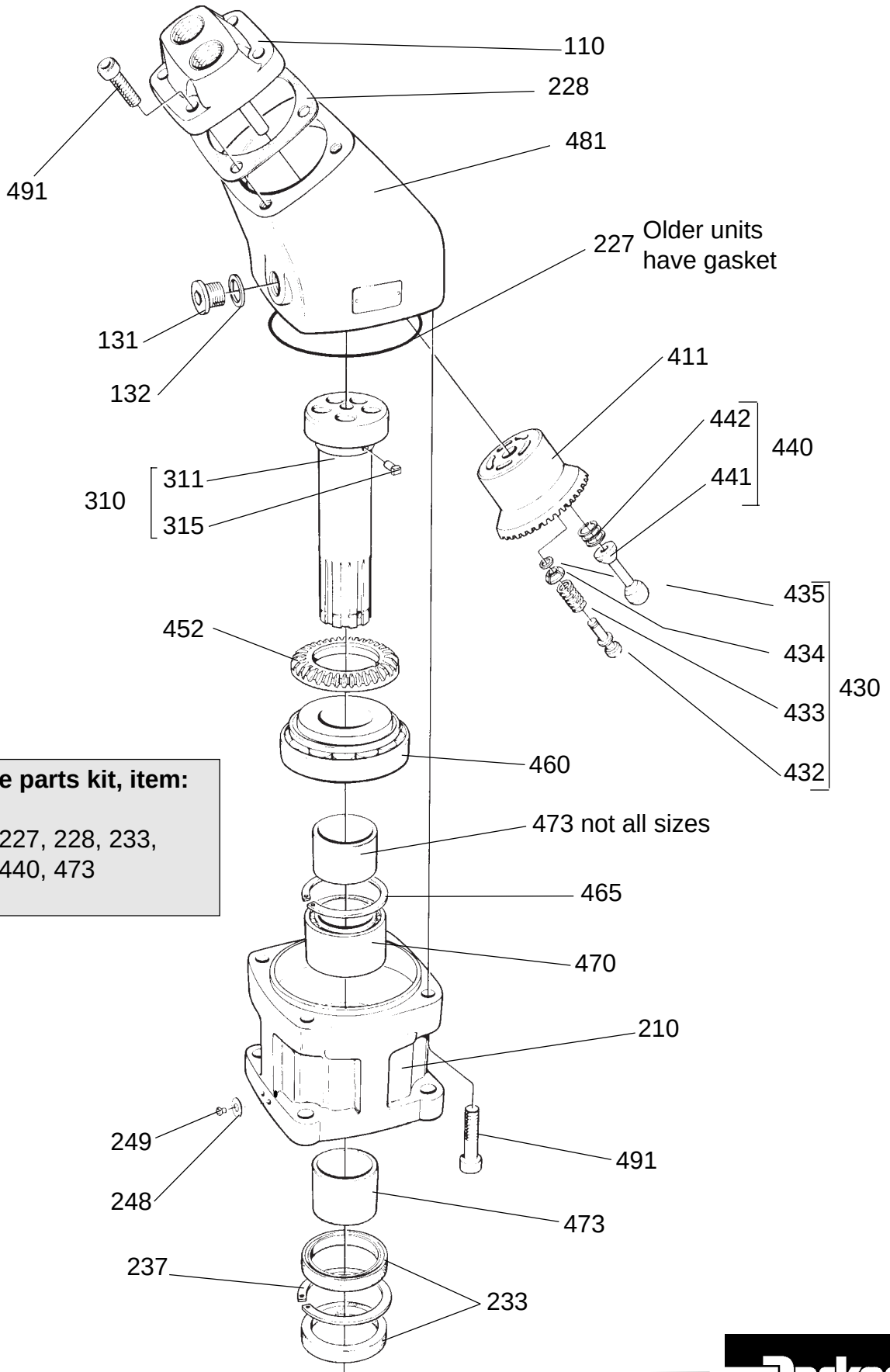
F1-41	3780857
F1-51	3780858
F1-61	3780859
F1-81	3780860
F1-101	3780861

Note! Not on all markets.

Parker
Mobile Hydraulics

Spare Parts Lists F1



Spare parts kit, item:

110, 227, 228, 233, 411, 440, 473

Item	Part No	Title	Benämning	Qty	Remarks
110	3704551	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
110	3793356	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3704533	BEARING HOUSING ASSY	LAGERHUS KPL	1	
227	3704547	GASKET	PACKNING	1	
227	3794264	O-RING	O-RING	1	From May 1991
228	3704548	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795430	SHAFT ASSY	AXEL KPL	1	Replaces 3704525
315	3792207	GUIDE PIN	STYRTAPP 6*11	1	
411	3704527	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709838	BARREL SUPPORT	TRUMSTÖD	1	
440	3706402	PISTON ASSY	KOLV KPL	5	
442	3705969	PISTON RING	LAMELLRING	15	
452	3797710	RING GEAR	KUGGKRANS	1	
460	3780418	TAP ROL BEARING 31307	KON RULLAGER 31307	1	Replaces 118840
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	3	Replaces 3703976
481	3794920	BARREL HOUSING	TRUMHUS	1	
491	949067	HEX SOCKET SCR.M10*30	INSEXSKRUV M10*30	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3704538	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
110	3791938	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3704533	BEARING HOUSING ASSY	LAGERHUS KPL	1	
227	3704547	GASKET	PACKNING	1	
227	3794264	O-RING	O-RING	1	From May 1991
228	3704548	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795431	SHAFT ASSY	AXEL KPL	1	Replaces 3704539
315	3792207	GUIDE PIN	STYRTAPP 6*11	1	
411	3704540	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709838	BARREL SUPPORT	TRUMSTÖD	1	
440	3706403	PISTON ASSY	KOLV KPL	5	
442	3795377	PISTON RING	LAMELLRING	15	
452	3797710	RING GEAR	KUGGKRANS	1	
460	3780418	TAP ROL BEARING 31307	KON RULLAGER 31307	1	Replaces 118840
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	3	Replaces 3703976
481	3794920	BARREL HOUSING	TRUMHUS	1	
491	949067	HEX SOCKET SCR.M10*30	INSEXSKRUV M10*30	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3791541	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
110	3703935	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3703825	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not Available
227	3703902	GASKET	PACKNING	1	
227	3794266	O-RING	O-RING	1	From May 1991
228	3703901	GASKET	PACKNING		Req. No.
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795432	SHAFT ASSY	AXEL KPL	1	Replaces 3704748
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3703937	CYLINDER BARREL	CYLINDERTRUMMA	1	Not available
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706404	PISTON ASSY	KOLV KPL	5	
442	3705784	PISTON RING	LAMELLRING	15	
452	3704560	RING GEAR	KUGGKRANS	1	Not available
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	2	Replaces 3703976
481	3794474	BARREL HOUSING	TRUMHUS	1	Not Available
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3791541	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
110	3703935	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3703825	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not available
227	3703902	GASKET	PACKNING	1	
227	3794266	O-RING	O-RING	1	From May 1991
228	3703901	GASKET	PACKNING		Req. No.
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795432	SHAFT ASSY	AXEL KPL	1	Replaces 3704748
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799394	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3795341
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706404	PISTON ASSY	KOLV KPL	5	
442	3705784	PISTON RING	LAMELLRING	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	2	Replaces 3703976
481	3794474	BARREL HOUSING	TRUMHUS	1	Not available
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3791541	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
110	3703935	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3797189	BEARING HOUSING ASSY	LAGERHUS KPL	1	Replaces 3703825
227	3703902	GASKET	PACKNING	1	
227	3797193	O-RING	O-RING	1	Replaces 3794266
228	3703901	GASKET	PACKNING		Req. No.
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795432	SHAFT ASSY	AXEL KPL	1	Replaces 3704748
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799394	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3795341
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706404	PISTON ASSY	KOLV KPL	5	
442	3705784	PISTON RING	LAMELLRING	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	3797156	TAP ROL BEARING 31308	KON RULLAGER 31308	1	
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	2	Replaces 3703976
481	3797190	BARREL HOUSING	TRUMHUS	1	Replaces 3794474
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3706473	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
110	3704513	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3797189	BEARING HOUSING ASSY	LAGERHUS KPL	1	Replaces 3703825
227	3703902	GASKET	PACKNING	1	
227	3797193	O-RING	O-RING	1	Replaces 3794266
228	3703901	GASKET	PACKNING		Req. No
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795433	SHAFT ASSY	AXEL KPL	1	Replaces 3704558
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799393	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3795340
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706405	PISTON ASSY	KOLV KPL	5	
442	3705975	PISTON RING	LAMELLRING	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	3797156	TAP ROL BEARING 31308	KON RULLAGER 31308	1	
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	2	Replaces 3703976
481	3797190	BARREL HOUSING	TRUMHUS	1	Replaces 3794474
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3706473	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
110	3704513	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3703825	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not available
227	3703902	GASKET	PACKNING	1	
227	3794266	O-RING	O-RING	1	From May 1991
228	3703901	GASKET	PACKNING		Req. No
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795433	SHAFT ASSY	AXEL KPL	1	Replaces 3704558
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3703868	CYLINDER BARREL	CYLINDERTRUMMA	1	Not available
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706405	PISTON ASSY	KOLV KPL	5	
442	3705975	PISTON RING	LAMELLRING	15	
452	3704560	RING GEAR	KUGGKRANS	1	Not available
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	2	Replaces 3703976
481	3794474	BARREL HOUSING	TRUMHUS	1	Not available
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3706473	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
110	3704513	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3703825	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not available
227	3703902	GASKET	PACKNING	1	
227	3794266	O-RING	O-RING	1	From May 1991
228	3703901	GASKET	PACKNING		Req. No
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795433	SHAFT ASSY	AXEL KPL	1	Replaces 3704558
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799393	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3795340
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706405	PISTON ASSY	KOLV KPL	5	
442	3705975	PISTON RING	LAMELLRING	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING	INNERRING	2	Replaces 3703976
481	3794474	BARREL HOUSING	TRUMHUS	1	Not available
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3704516	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
211	3708113	BEARING HOUSING	LAGERHUS	1	
210	3705044	BEARING HOUSING ASSY	LAGERHUS KPL	1	045-type
227	3705057	GASKET	PACKNING	1	
227	3794268	O-RING	O-RING	1	From May 1991
228	3703977	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795435	SHAFT ASSY	AXEL KPL	1	Replaces 3704554
315	3709308	GUIDE PIN	STYRTAPP 10*17,5	1	
411	3703989	CYLINDER BARREL	CYLINDERTRUMMA	1	Not available
430	3709840	BARREL SUPPORT	TRUMSTÖD	1	
440	3706406	PISTON ASSY	KOLV KPL	5	
442	3705764	PISTON RING	LAMELLRING	15	
452	3704556	RING GEAR	KUGGKRANS	1	Not available
460	184660	TAP ROL BEARING	KON RULLAGER T7FC 055	1	
465	914537	RETAINING RING SGH72	SPÅRRING SGH72	1	
470	3705743	CYL BEARING NU2207ECP	CYL LAGER NU2207ECP	1	
473	3796039	INNER RING	INNERRING	1	Replaces 3703976
481	3794992	BARREL HOUSING	TRUMHUS	1	
491	968580	HEX SOCKET SCREW	INSEXSKRUV M12*45	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3795502	END CAP ASSY	ANSLUTNINGSTOPP	1	M-type
110	3707570	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3708734	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not available
227	3708741	GASKET	PACKNING	1	
227	3794267	O-RING	O-RING	1	From May 1991
228	3708742	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795434	SHAFT ASSY	AXEL KPL	1	Replaces 3708736
315	3709308	GUIDE PIN	STYRTAPP 10*17,5	1	
411	3708738	CYLINDER BARREL	CYLINDERTRUMM	1	Not available
430	3709840	BARREL SUPPORT	TRUMSTÖD	1	
440	3706406	PISTON ASSY	KOLV KPL	5	
442	3705764	PISTON RING	LAMELLRING	15	
452	3708740	RING GEAR	KUGGKR	1	Not available
460	184687	TAP ROL BEARING	KON RULLAGER T7FC 050	1	
465	914537	RETAINING RING SGH72	SPÅRRING SGH72	1	
470	3705743	CYL BEARING NU2207ECP	CYL LAGER NU2207ECP	1	
473	3796039	INNER RING	INNERRING	1	Replaces 3703976
481	3794921	BARREL HOUSING	TRUMHUS	1	Not available
491	968580	HEX SOCKET SCREW	INSEXSKRUV M12*45	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3795502	END CAP ASSY	ANSLUTNINGSTOPP	1	M-type
110	3707570	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3708734	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not available
227	3708741	GASKET	PACKNING	1	
227	3794267	O-RING	O-RING	1	From May 1991
228	3708742	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795434	SHAFT ASSY	AXEL KPL	1	Replaces 3708736
315	3709308	GUIDE PIN	STYRTAPP 10*17,5	1	
411	3796342	CYLINDER BARREL	CYLINDERTRUMM	1	
430	3709840	BARREL SUPPORT	TRUMSTÖD	1	
440	3706406	PISTON ASSY	KOLV KPL	5	
442	3705764	PISTON RING	LAMELLRING	15	
452	3796341	RING GEAR	KUGGKR	1	
460	184687	TAP ROL BEARING	KON RULLAGER T7FC 050	1	
465	914537	RETAINING RING SGH72	SPÅRRING SGH72	1	
470	3705743	CYL BEARING NU2207ECP	CYL LAGER NU2207ECP	1	
473	3796039	INNER RING	INNERRING	1	Replaces 3703976
481	3794921	BARREL HOUSING	TRUMHUS	1	Not available
491	968580	HEX SOCKET SCREW	INSEXSKRUV M12*45	8	KLASS 10.9

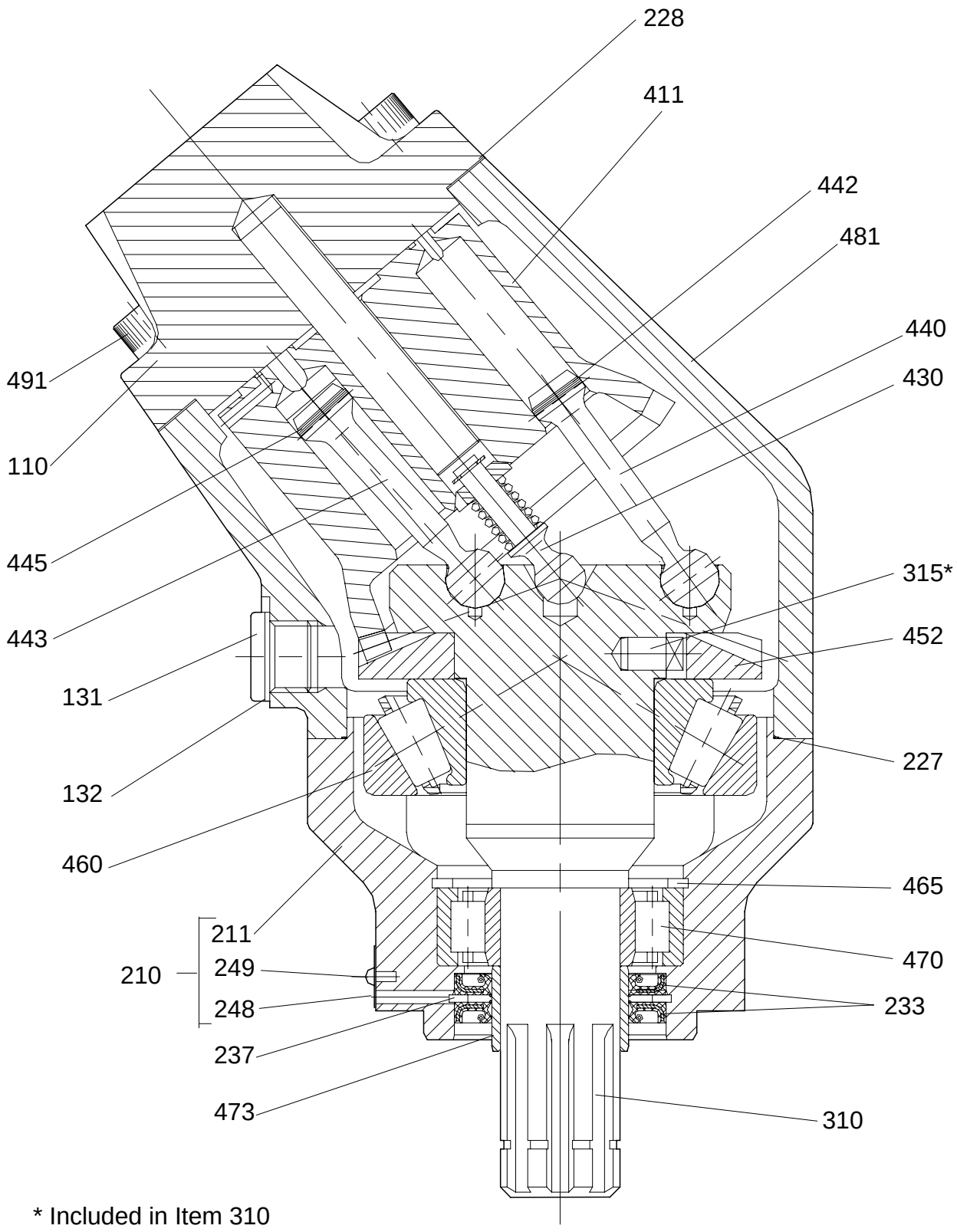
Item	Part No	Title	Benämning	Qty	Remarks
110	3707570	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3796490	BEARING HOUSING ASSY	LAGERHUS KPL	1	
211	3796489	BEARING HOUSING	LAGERHUS	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
227	3796504	O-RING 107*3 N 70	O-RING 107*3 N 70	1	
228	3708742	GASKET 0.25	PACKNING 0,25	2	
228	3794906	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795434	SHAFT ASSY	AXEL KPL	1	
311	3708736	SHAFT	AXEL	1	
315	3709308	GUIDE PIN	STYRTAPP 10*17,5	1	
411	3796342	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709840	BARREL SUPPORT	TRUMSTÖD	1	
440	3706406	PISTON ASSY	KOLV KPL	5	
442	3705764	PISTON RING DIA 24.15	LAMELLRING DIAM 24.15	15	
452	3796341	RING GEAR	KUGGKRANS	1	
460	184687	TAP ROL BEARING	KON RULLAGER T7FC 050	1	
465	914537	RETAINING RING SGH72	SPÅRRING SGH72	1	
470	3705743	CYL BEARING NU2207ECP	CYL LAGER NU2207ECP	1	
473	3796039	INNER RING 35*40*25	INNERRING 35*40*25	1	
481	3796283	BARREL HOUSING	TRUMHUS	1	
491	968580	HEX S SCR M12*45 10.9	INS SKRUV M12*45 10.9	8	

Item	Part No	Title	Benämning	Qty	Remarks
110	3704794	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
110	3705871	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	M-type
118	114801	SET SCREW M5*6	STOPPSKRUV M5*6	1	M-type
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3708113	BEARING HOUSING ASSY	LAGERHUS KPL	1	
210	3705044	BEARING HOUSING ASSY	LAGERHUS KPL	1	045-type
227	3705057	GASKET	PACKNING	1	
227	3794268	O-RING	O-RING	1	From May 1991
228	3703977	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
310	3795436	SHAFT ASSY	AXEL KPL	1	Replaces 3704598
315	3709308	GUIDE PIN	STYRTAPP 10*17,5	1	
411	3795314	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709840	BARREL SUPPORT	TRUMSTÖD	1	
440	3706407	PISTON ASSY	KOLV KPL	7	
442	3705975	PISTON RING	LAMELLRING	21	
452	3795313	RING GEAR	KUGGKRANS	1	
460	184660	TAP ROL BEARING	KON RULLAGER T7FC 055	1	
465	914537	RETAINING RING SGH72	SPÅRRING SGH72	1	
470	3705743	CYL BEARING NU2207ECP	CYL LAGER NU2207ECP	1	
473	3796039	INNER RING	INNERRING	1	Replaces 3703979
481	3794992	BARREL HOUSING	TRUMHUS	1	
491	968580	HEX SOCKET SCREW	INSEXSKRUV M12*45	8	KLASS 10.9

To fit	Part No	Title	Benämning	Serialno:
F1-020	3705755	Spare Parts Kit	Reservdelssats	
F1-020 SAE	3794962	Spare Parts Kit	Reservdelssats	
F1-020-M	3796901	Spare Parts Kit	Reservdelssats	
F1-030	3705756	Spare Parts Kit	Reservdelssats	
F1-030 SAE	3794963	Spare Parts Kit	Reservdelssats	
F1-030-M	3792291	Spare Parts Kit	Reservdelssats	
F1-040	3705757	Spare Parts Kit	Reservdelssats	Not avaiable
F1-040 Kugg 92	3780152	Spare Parts Kit	Reservdelssats	> 1993220000
F1-040 SAE	3794964	Spare Parts Kit	Reservdelssats	Not available
F1-040 SAE Kugg 92	3780153	Spare Parts Kit	Reservdelssats	> 1993220000
F1-040-M	3792292	Spare Parts Kit	Reservdelssats	Not available
F1-040-M Kugg 92	3780154	Spare Parts Kit	Reservdelssats	> 1993220000
F1-060	3705758	Spare Parts Kit	Reservdelssats	Not available
F1-060 Kugg 92	3780150	Spare Parts Kit	Reservdelssats	> 1993220000
F1-060 SAE	3794965	Spare Parts Kit	Reservdelssats	Not available
F1-060 SAE Kugg 92	3780149	Spare Parts Kit	Reservdelssats	> 1993220000
F1-060-M	3792293	Spare Parts Kit	Reservdelssats	Not available
F1-060-M Kugg 92	3780151	Spare Parts Kit	Reservdelssats	> 1993220000
F1-080	3705759	Spare Parts Kit	Reservdelssats	Not available
F1-080 Slim version	3796903	Spare Parts Kit	Reservdelssats	> 9206120
F1-080 Slim version	3709770	Spare Parts Kit	Reservdelssats	Not available
F1-080-M	3796902	Spare Parts Kit	Reservdelssats	
F1-110	3705760	Spare Parts Kit	Reservdelssats	Not available
F1-110	3795318	Spare Parts Kit	Reservdelssats	> 9150001
F1-110-M	3792294	Spare Parts Kit	Reservdelssats	Not available
F1-110-M	3795319	Spare Parts Kit	Reservdelssats	> 9150001
F1-053/053-L	3780317	Spare Parts Kit	Reservdelssats	Rep. 3796905
F1-053/053-R	3780318	Spare Parts Kit	Reservdelssats	Rep. 3796904
F1-055/045-L	3780317	Spare Parts Kit	Reservdelssats	Rep. 3796905
F1-055/045-R	3780318	Spare Parts Kit	Reservdelssats	Rep. 3796904
F1-070/035-L	3780320	Spare Parts Kit	Reservdelssats	Rep. 3796907
F1-070/035-R	3780319	Spare Parts Kit	Reservdelssats	Rep. 3796906
T1-050	3793572	Sealing Kit	Tätningssats	

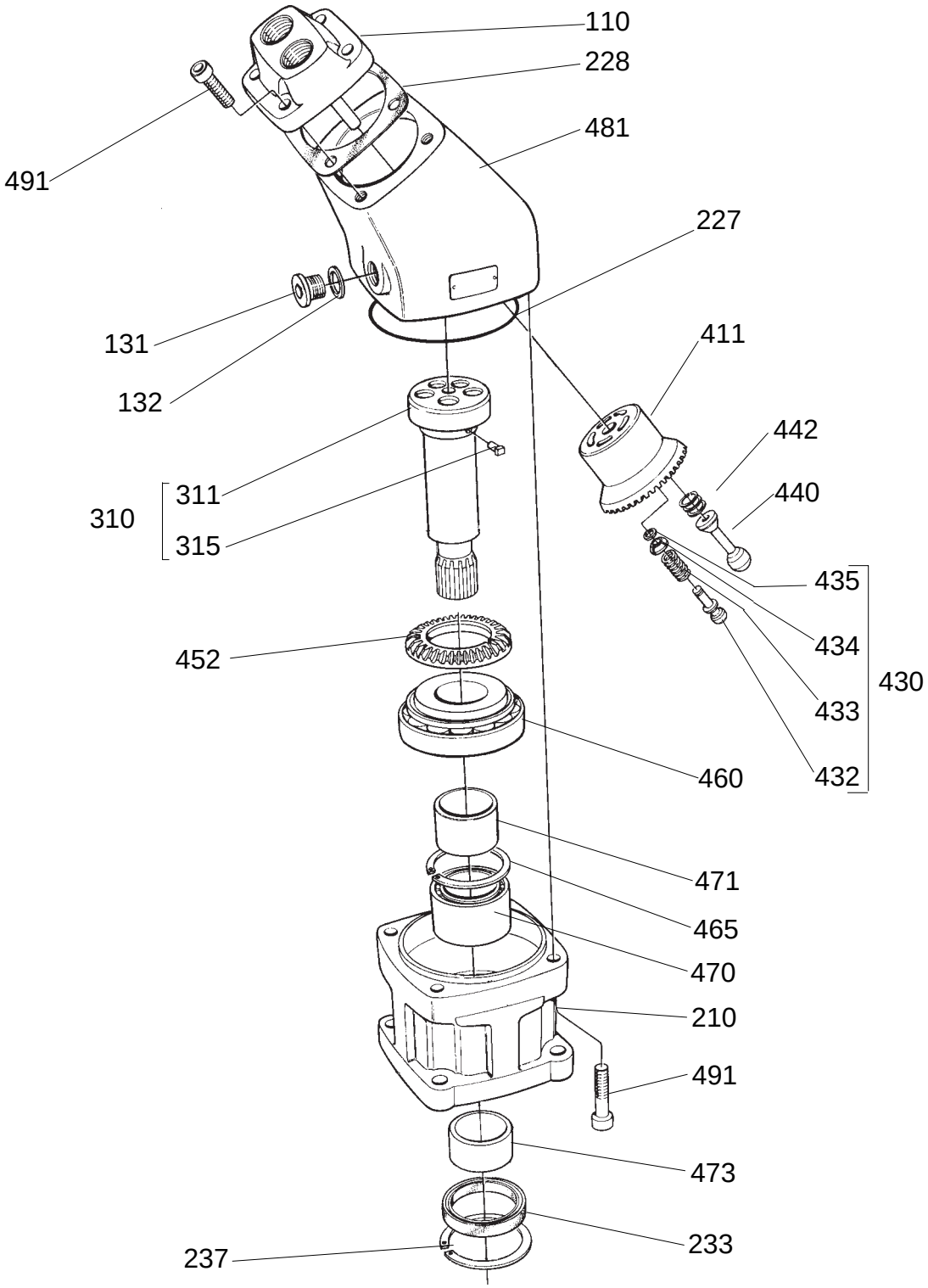
The Kits comprise items 110, 227, 228, 233, 411, 440 and 473. If more parts are required it is normally not profitable to carry out a repair.

If there is any doubt about the type, please refer to ASM 4.1 SI 94/04.



* Included in Item 310

Item	Part No	Title	Benämning	Qty	Remarks
110	3799946	End Cap assy	Anslutningstopp kpl	1	R-rotation,55/45 Repl.3791999
110	3799945	End Cap assy	Anslutningstopp kpl	1	L-rotation,55/45 Repl.3794608
110	3799942	End Cap assy	Anslutningstopp kpl	1	R-rotation,70/35 Repl.3795284
110	3799944	End Cap assy	Anslutningstopp kpl	1	L-rotation,70/35 Repl.3795285
131	944507	Hex. Socket Plug	Insexpropp	1	
132	957184	Seal Washer	Tätbricka	1	
210	3708113	Bearing Housing Assy	Lagerhus,kpl	1	
227	3705057	Gasket	Packning	1	
227	3794268	O-ring	O-ring	1	From May 1991
228	3703977	Gasket	Packning		0.25 mm
233	118773	Shaft Seal	Tätningsring	2	40*62*6
237	967822	Retaining Ring	Spårring	1	
248	3793510	Washer	Bricka	1	
249	116090	Grooved Rivet	Nit	1	
310	3795440	Shaft,assy	Axel,kpl	1	55/45 and 70/35
310	3796655	Shaft,assy	Axel,kpl	1	53/53
315	3709308	Guide Pin	Styrtapp	1	Included in Item 310
411	3795317	Cylinder Barrel	Cylindertrumma	1	55/45 and53/53
411	3780484	Cylinder Barrel	Cylindertrumma	1	70/35 Replaces 3795271
430	3709840	Barrel Support	Trumstöd	1	
440	3791993	Piston assy	Kolv kpl	5	Outer, 55,53 cc and Inner 35cc
442	3795377	Piston Ring	Lamellring	15	
443	3791991	Piston assy	Kolv kpl	5	Inner, 45,53 cc and Outer 70 cc
445	3705784	Piston Ring	Lamellring	15	
452	3795313	Ring Gear	Kuggkrans	1	
460	184660	Tapered Roller Bearing	Kon. Rullager	1	T7FC 055
465	914537	Retaining Ring	Spårring	1	
470	3705743	Cylindrical Bearing	Cyl. Lager	1	NU2207ECP
473	3796039	Inner Ring	Innerring	1	Replaces 3703976
481	3794992	Barrel Housing	Trumhus	1	
491	968580	Hex. Socket Screw	Insexskruv	8	M12*45, 10.9


110
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237

Item	Part No	Title	Benämning	Qty	Remarks
110	3794223	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3794227	BEARING HOUSING	LAGERHUS TYP S	1	
227	3794264	O-RING 86*1.6 N 70	O-RING 86*1,6 N 70	1	
228	3704548	GASKET 0.25	PACKNING 0,25	2	
228	3794903	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	1	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795446	SHAFT ASSY	AXEL KPL	1	
315	3792207	GUIDE PIN	STYRTAPP 6*11	1	
411	3704527	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709838	BARREL SUPPORT	TRUMSTÖD	1	
440	3706402	PISTON ASSY	KOLV KPL	5	
442	3705969	PISTON RING DIA 15.15	LAMELLRING DIAM 15.15	15	
452	3797710	RING GEAR	KUGGKRANS	1	
460	3780418	TAP ROL BEARING 31307	KON RULLAGER 31307	1	Replaces 118840
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
471	3796039	INNER RING 35*40*25	INNERRING 35*40*25	2	
473	3794954	INNER RING 35*40*17	INNERRING 35*40*17	1	
478	977802	RETAINING RING SW35	SPÅRRING SW35	1	
481	3794920	BARREL HOUSING	TRUMHUS	1	
491	949067	HEX S SCR M10*30 10.9	INS SKRUV M10*30 10.9	8	10.9

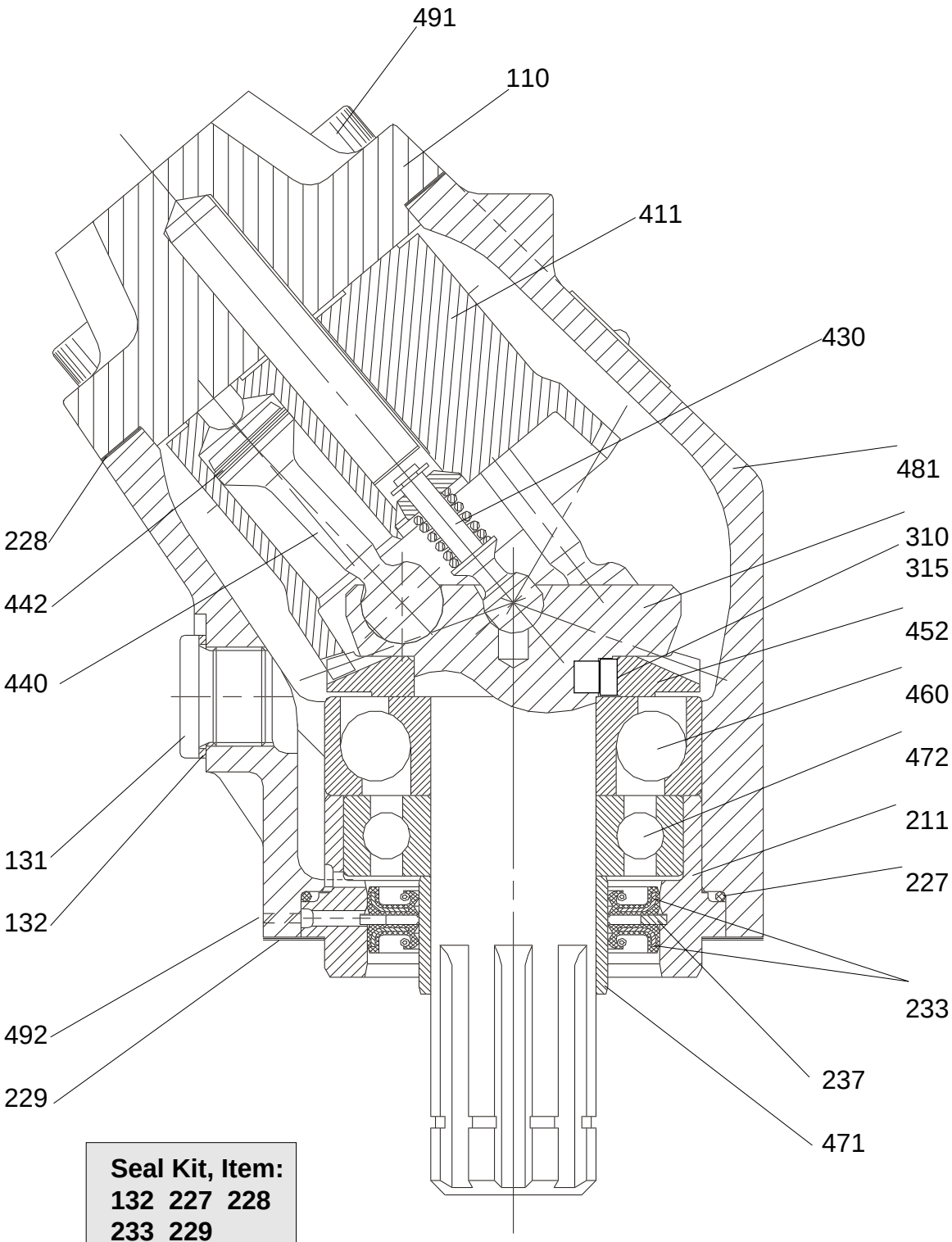
Item	Part No	Title	Benämning	Qty	Remarks
110	3794233	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3794227	BEARING HOUSING	LAGERHUS TYP S	1	
227	3794264	O-RING 86*1.6 N 70	O-RING 86*1,6 N 70	1	
228	3704548	GASKET 0.25	PACKNING 0,25	2	
228	3794903	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	1	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795447	SHAFT ASSY	AXEL KPL	1	
315	3792207	GUIDE PIN	STYRTAPP 6*11	1	
411	3704540	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709838	BARREL SUPPORT	TRUMSTÖD	1	
440	3706403	PISTON ASSY	KOLV KPL	5	
442	3795377	PISTON RING DIA 17.15	LAMELLRING DIAM 17.15	15	
452	3797710	RING GEAR	KUGGKRANS	1	
460	3780418	TAP ROL BEARING 31307	KON RULLAGER 31307	1	Replaces 118840
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
471	3796039	INNER RING 35*40*25	INNERRING 35*40*25	2	
473	3794954	INNER RING 35*40*17	INNERRING 35*40*17	1	
478	977802	RETAINING RING SW35	SPÅRRING SW35	1	
481	3794920	BARREL HOUSING	TRUMHUS	1	
491	949067	HEX S SCR M10*30 10.9	INS SKRUV M10*30 10.9	8	

Item	Part No	Title	Benämning	Qty	Remarks
110	3794243	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3794247	BEARING HOUSING	LAGERHUS TYP S	1	
227	3794266	O-RING 96.6*1.6 N 70	O-RING 96,6*1,6 N 70	1	
228	3703901	GASKET 0.25	PACKNING 0,25	2	
228	3794904	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	1	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795443	SHAFT ASSYTYPE S	AXEL KPL TYP S	1	
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3795341	CYLINDER BARREL	CYLINDERTRUMMA	1	Not available
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706404	PISTON ASSY	KOLV KPL	5	
442	3705784	PISTON RING DIA 19	LAMELLRING DIAM 19	15	
452	3795834	RING GEAR	KUGGKRANS	1	Not available
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	ALT 3793547
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
471	3796039	INNER RING 35*40*25	INNERRING 35*40*25	1	Replaces 3703976
473	3795766	INNER RING	INNERRING	1	
481	3794474	BARREL HOUSING	TRUMHUS	1	
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3794243	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3794247	BEARING HOUSING	LAGERHUS TYP S	1	
227	3794266	O-RING 96.6*1.6 N 70	O-RING 96,6*1,6 N 70	1	
228	3703901	GASKET 0.25	PACKNING 0,25	2	
228	3794904	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	1	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3799874	SHAFT ASSY TYPE S	AXEL KPL TYP S	1	Replaces 3795443
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799394	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3795341
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706404	PISTON ASSY	KOLV KPL	5	
442	3705784	PISTON RING DIA 19	LAMELLRING DIAM 19	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	ALT 3793547
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3799892	INNER RING 35*40*50	INNERRING 35*40*50	1	Replaces 3795766
481	3794474	BARREL HOUSING	TRUMHUS	1	
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3794263	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3794247	BEARING HOUSING	LAGERHUS TYP S	1	
227	3794266	O-RING 96.6*1.6 N 70	O-RING 96,6*1,6 N 70	1	
228	3703901	GASKET 0.25	PACKNING 0,25	2	
228	3794904	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	1	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795442	SHAFT ASSY TYPE S	AXEL KPL TYPE S	1	
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3703868	CYLINDER BARREL	CYLINDERTRUMMA	1	Not available
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706405	PISTON ASSY	KOLV KPL	5	
442	3705975	PISTON RING DIA 21.6	LAMELLRING DIAM 21,6	15	
452	3704560	RING GEAR	KUGGKRANS	1	Not available
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	ALT 3793547
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
471	3796039	INNER RING 35*40*25	INNERRING 35*40*25	1	Replaces 3703976
473	3795766	INNER RING	INNERRING	1	
481	3794474	BARREL HOUSING	TRUMHUS	1	
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	8	KLASS 10.9

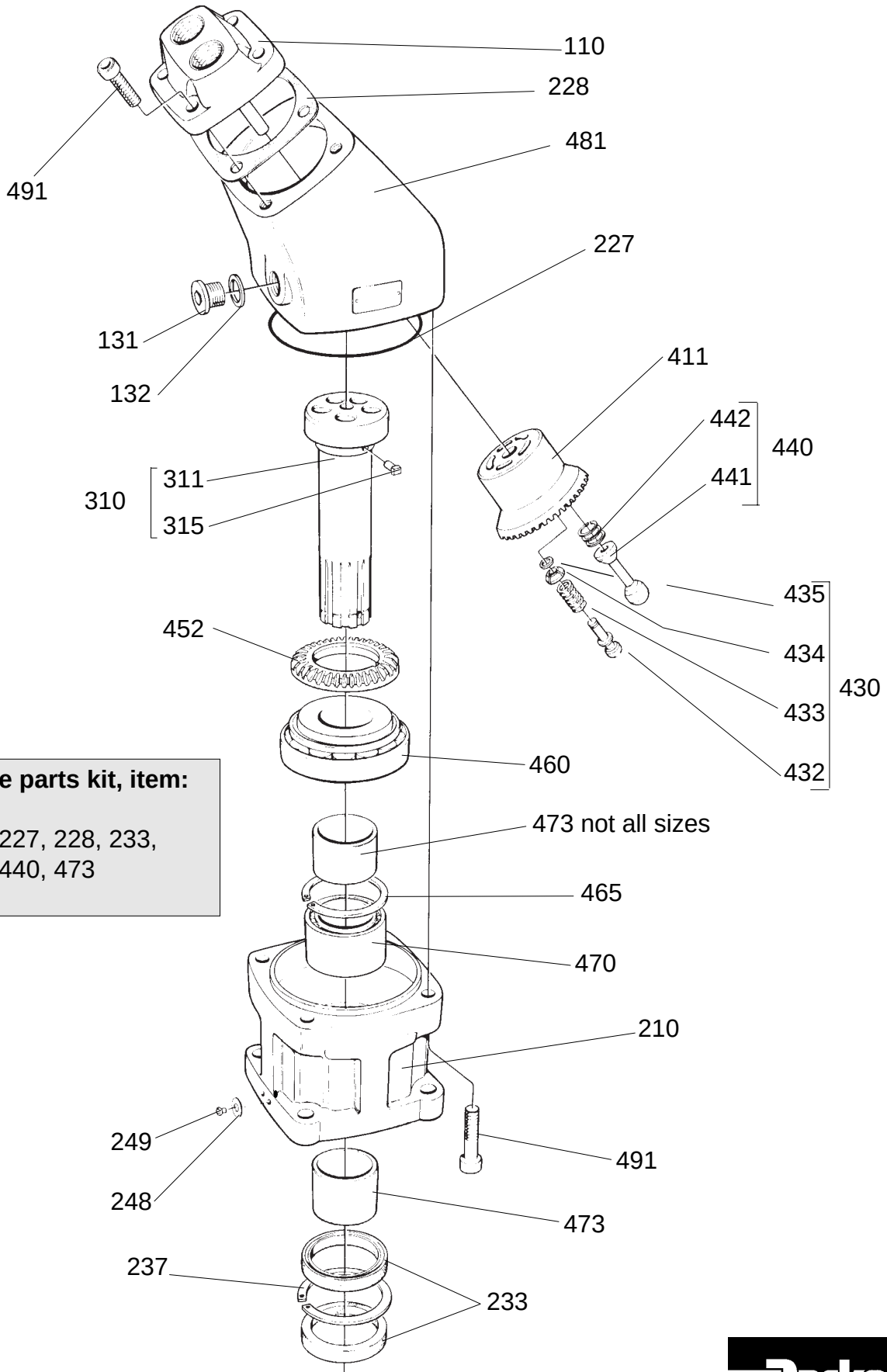
Item	Part No	Title	Benämning	Qty	Remarks
110	3794263	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3794247	BEARING HOUSING	LAGERHUS TYP S	1	
227	3794266	O-RING 96.6*1.6 N 70	O-RING 96,6*1,6 N 70	1	
228	3703901	GASKET 0.25	PACKNING 0,25	2	
228	3794904	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	1	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3799878	SHAFT ASSY TYPE S	AXEL KPL TYPE S	1	Replaces 3795442
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799393	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3795340
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3706405	PISTON ASSY	KOLV KPL	5	
442	3705975	PISTON RING DIA 21.6	LAMELLRING DIAM 21,6	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	ALT 3793547
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3799892	INNER RING 35*40*50	INNERRING 35*40*50	1	Replaces 3795766
481	3794474	BARREL HOUSING	TRUMHUS	1	
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	8	KLASS 10.9



Seal Kit, Item:
132 227 228
233 229

Item	Part No	Title	Benämning	Qty	Remarks
110	3792021	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
211	3792877	SEAL CARRIER	TÄTRINGSHÅLLARE	1	
227	925095	O-RING 84.5*3	O-RING 84,5*3	1	70 IRH
228	3792022	GASKET	PACKNING		
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING IK62	SPÅRRING IK62 DIN 984	1	
229	3793130	GASKET	PACKNING	1	
311	3792023	SHAFT	AXEL	1	Not available
411	3792025	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3792027	PISTON ASSY	KOLV KPL	5	
442	3792841	PISTON RING	LAMELLRING	15	
452	3792029	RING GEAR	KUGGKRANS	1	
460	183241	BEARING	V KONT KULLAG 7307B	1	
472	11014	BEARING	KULLAG 6207	1	
471	3796039	INNER RING	INNERRING	1	Replaces 3703976
481	3709309	BARREL HOUSING	TRUMHUS	1	
491	949068	HEX SOCKET SCREW	INSEXSKRUV M10*35	4	KLASS 10.9
492	967299	SET SCREW	STOPPSKRUV M4*10	1	
	3793572	SEAL KIT	TÄTNINGSSATS		

Item	Part No	Title	Benämning	Qty	Remarks
110	3792021	248 CAP ASS3793510	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
211	3792877	SEAL CARRIER	TÄTRINGSHÅLLARE	1	
227	925095	O-RING 84.5*3 N 70	O-RING 84,5*3 N 70	1	
228	3792022	GASKET 0.25	PACKNING 0,25	2	
228	3794907	GASKET 0.40	PACKNING 0,40	2	
229	3793130	GASKET	PACKNING	1	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3796172	SHAFT ASSY	AXEL KPL	1	
311	3796167	SHAFT	AXEL	1	
315	3792207	GUIDE PIN	STYRTAPP 6*11	1	
411	3792025	CYLINDER BARREL	CYLINDERTRUMMA	1	
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
440	3792027	PISTON ASSY	KOLV KPL	5	
442	3792841	PISTON RING DIA 20.65	LAMELLRING DIAM 20,65	15	
452	3797710	RING GEAR	KUGGKRANS	1	
460	183241	BEARING	V KONT KULLAG 7307B	1	
471	3796039	INNER RING 35*40*25	INNERRING 35*40*25	1	
472	11014	BEARING	KULLAGER 6207	1	
480	3709309	BARREL HOUSING ASSY	TRUMHUS KPL	1	
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
481	3794958	BARREL HOUSING	TRUMHUS	1	
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	4	10.9
492	967299	SET SCREW	STOPPSKRUV M4*10	1	

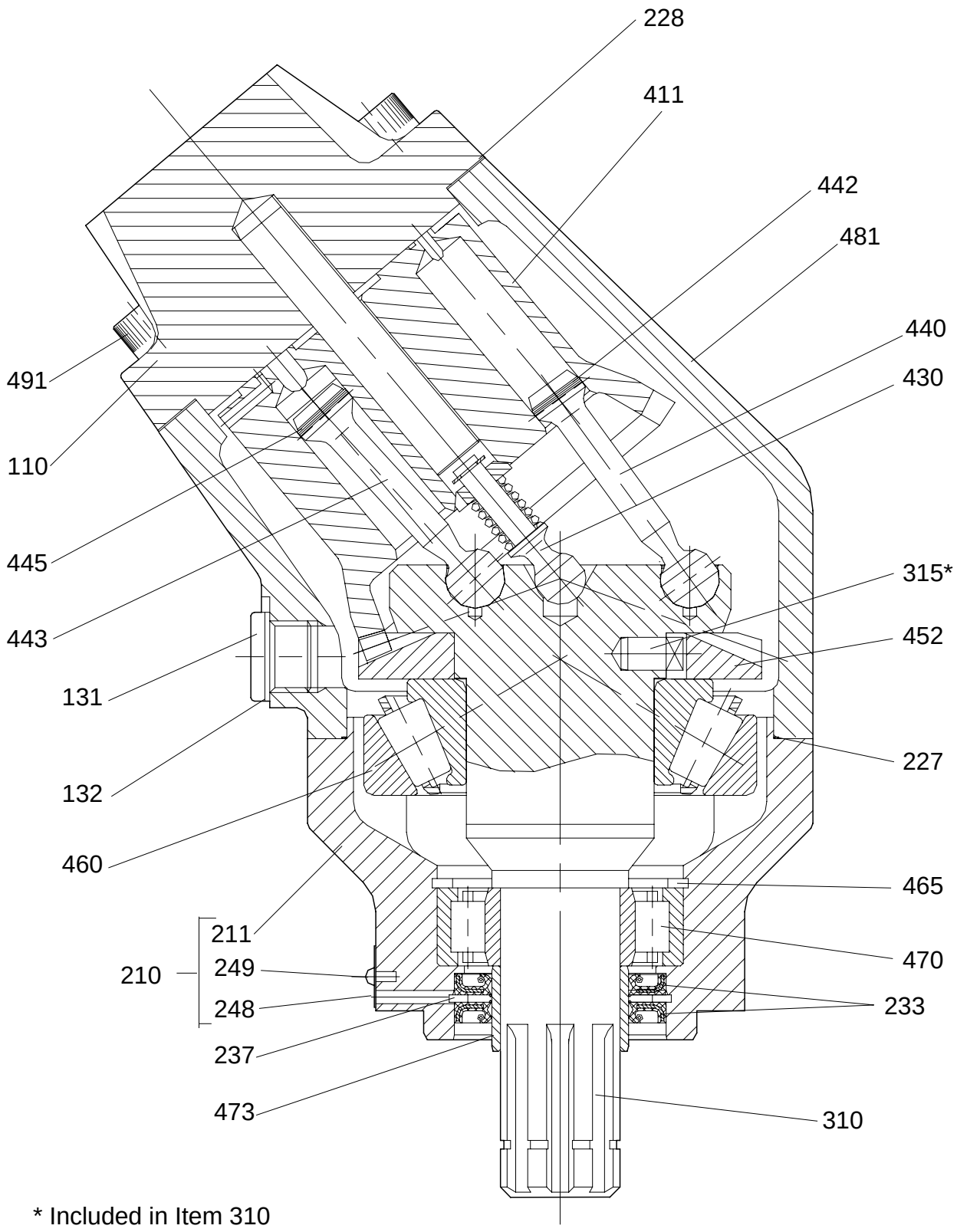


Spare parts kit, item:

110, 227, 228, 233,
411, 440, 473

Item	Part No	Title	Benämning	Qty	Remarks
110	3796529	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3703825	BEARING HOUSING ASSY	LAGERHUS KPL	1	Not available
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
227	3794266	O-RING	O-RING	1	
228	3703901	GASKET 0.25	PACKNING 0,25	2	
228	3794904	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795433	SHAFT ASSY	AXEL KPL	1	
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799396	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces 3796522
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
432	3703894	SUPPORT PIN	STÖDTAPP	1	
433	3703899	COMPRESSION SPRING	TRYCKFJÄDER	1	
434	3703895	SUPPORT RING	STÖDRING	1	
435	951667	CIRCLIP 4*0.7	SPÅRRYTTARE 4*0,7	1	
440	3796530	PISTON ASSY	KOLV KPL	5	
442	3796526	PISTON RING DIA 25	LAMELLRING DIAM 25	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	118025	TAP ROL BEARING 31308	KON RULLAGER 31308	1	ALT 3793547
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING 35*40*25	INNERRING 35*40*25	2	
481	3794474	BARREL HOUSING	TRUMHUS	1	Not available
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	8	KLASS 10.9

Item	Part No	Title	Benämning	Qty	Remarks
110	3796529	END CAP ASSY	ANSLUTNINGSTOPP KPL	1	
131	944507	HEX SOCKET PLUG R1/2	INSEXPROPP R1/2	1	
132	957184	SEAL WASHER 21*26	TÄTBRICKA 21*26	1	
210	3797189	BEARING HOUSING ASSY	LAGERHUS KPL	1	Replaces 3703825
248	3793510	WASHER	BRICKA	1	
249	116090	GROOVED RIVET	NIT	1	
227	3797193	O-RING	O-RING	1	Replaces 3794266
228	3703901	GASKET 0.25	PACKNING 0,25	2	
228	3794904	GASKET 0.40	PACKNING 0,40	2	
233	118773	SHAFT SEAL 40*62*6	TÄTNINGSRING 40*62*6	2	
237	967822	RETAINING RING JK62	SPÅRRING JK62 DIN 984	1	
310	3795433	SHAFT ASSY	AXEL KPL	1	
315	3709162	GUIDE PIN	STYRTAPP 8*16	1	
411	3799396	CYLINDER BARREL	CYLINDERTRUMMA	1	Replaces3796522
430	3709839	BARREL SUPPORT	TRUMSTÖD	1	
432	3703894	SUPPORT PIN	STÖDTAPP	1	
433	3703899	COMPRESSION SPRING	TRYCKFJÄDER	1	
434	3703895	SUPPORT RING	STÖDRING	1	
435	951667	CIRCLIP 4*0.7	SPÅRRYTTARE 4*0,7	1	
440	3796530	PISTON ASSY	KOLV KPL	5	
442	3796526	PISTON RING DIA 25	LAMELLRING DIAM 25	15	
452	3799395	RING GEAR	KUGGKRANS	1	Replaces 3795834
460	3797156	TAP ROL BEARING 31308	KON RULLAGER 31308	1	ALT 3793547
465	914530	RETAINING RING SGH55	SPÅRRING SGH55	1	
470	3703905	NEEDLE BEARING	NÅLLAGER NKS40	1	
473	3796039	INNER RING 35*40*25	INNERRING 35*40*25	2	
481	3797190	BARREL HOUSING	TRUMHUS	1	Replaces 3794474
491	949068	HEX S SCR M10*35 10.9	INS SKRUV M10*35 10.9	8	KLASS 10.9



* Included in Item 310

Item	Part No	Title	Benämning	Qty	Remarks	
110	3799942	End Cap assy	Anslutningstopp kpl	1	R-rotation, 70/35	
110	3799944	End Cap assy	Anslutningstopp kpl	1	L-rotation, 70/35	
110	3799945	End Cap assy	Anslutningstopp kpl	1	L-rotation, 53/53	
110	3799946	End Cap assy	Anslutningstopp kpl	1	R-rotation, 53/53	
110	3781442	End Cap assy	Anslutningstopp kpl	1	R-rotation, 70/35 -plus	
110	3781444	End Cap assy	Anslutningstopp kpl	1	L-rotation, 70/35 -plus	
110	3781445	End Cap assy	Anslutningstopp kpl	1	L-rotation, 53/53 -plus	
110	3781446	End Cap assy	Anslutningstopp kpl	1	R-rotation, 53/53 -plus	
131	944507	Hex. Socket Plug	Insexpropp	1		
132	957184	Seal Washer	Tätbricka	1		
210	3708113	Bearing Housing Assy	Lagerhus,kpl	1		
227	3794268	O-ring	O-ring	1		
228	3703977	Gasket	Packning		0.25 mm	
228	3794905	Gasket	Packning		0.40 mm	
233	118773	Shaft Seal	Tätningsring	2	40*62*6	
237	967822	Retaining Ring	Spårring	1		
248	3793510	Washer	Bricka	1		
249	116090	Grooved Rivet	Nit	1		
310	3795440	Shaft, assy	Axel, kpl	1	70/35	
310	3796655	Shaft, assy	Axel, kpl	1	53/53	
411	3780207	Cylinder Barrel	Cylindertrumma	1	53/53	replaces 3795317
411	3780484	Cylinder Barrel	Cylindertrumma	1	70/35	
430	3709840	Barrel Support	Trumstöd	1		
440	3799991	Piston assy	Kolv kpl	5	70/35	
440	3791993	Piston assy	Kolv kpl	5	53/53	
442	3705784	Piston Ring	Lamellring	15	for 3799991	
442	3795377	Piston Ring	Lamellring	15	for 3791993	
443	3791993	Piston assy	Kolv kpl	5	70/35	
443	3799991	Piston assy	Kolv kpl	5	53/53	
445	3795377	Piston Ring	Lamellring	15	for 3791993	
445	3705784	Piston Ring	Lamellring	15	for 3799991	
452	3795313	Ring Gear	Kuggkrans	1		
460	184660	Tapered Roller Bearing	Kon. Rullager	1	T7FC 055	
465	914537	Retaining Ring	Spårring	1		
470	3705743	Cylindrical Bearing	Cyl. Lager	1	NU2207ECP	
473	3796039	Inner Ring	Innerring	1		
481	3780067	Barrel Housing	Trumhus	1		
491	968580	Hex. Socket Screw	Insexskruv	8	M12*45, 10.9	

Kits for F2-053/053,-070/035

To fit	Part No	Title	Benämning	Serialno:
F2-053/053-L	3780317	Spare Parts Kit	Reservdelssats	1997470001
F2-053/053-R	3780318	Spare Parts Kit	Reservdelssats	1997470002
F2-070/035-L	3780320	Spare Parts Kit	Reservdelssats	1997470003
F2-070/035-R	3780319	Spare Parts Kit	Reservdelssats	1997470004

Please refer to ASM 4.1 SI 98/01.

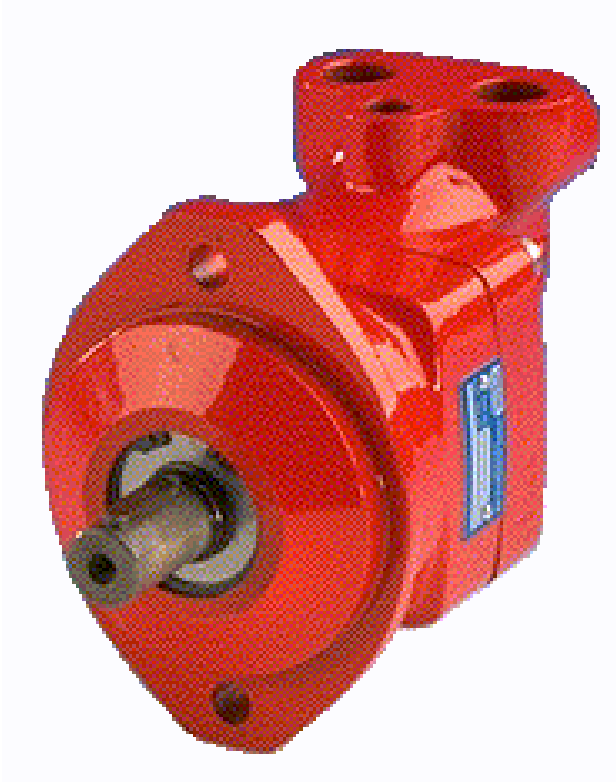
Kits for F2-plus -053/053,-070/035

To fit	Part No	Title	Benämning	Serialno:
F2-053/053-L	3781568	Spare Parts Kit	Reservdelssats	2000070001
F2-053/053-R	3781569	Spare Parts Kit	Reservdelssats	2000070001
F2-070/035-L	3781571	Spare Parts Kit	Reservdelssats	2000070001
F2-070/035-R	3781570	Spare Parts Kit	Reservdelssats	2000070001

The Kits comprise items 110, 227, 228, 233, 411, 440, 443 and 473. If more parts are required it is normally not profitable to carry out a repair.

Service Manual
ASM 3.1 -F11
F11-5 through -250

Catalog 9129 8205-02
Februari 2001, GB



Safety Precautions

Certain service procedures may require the vehicle/machine to be disabled (wheels raised off ground, work function disconnected, etc.) while performing them in order to prevent injury to technician and bystanders.

Use caution when dealing with hydraulic fluid under pressure. Escaping hydraulic fluid under pressure can have sufficient force to penetrate your skin causing serious injury.

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Parts Identification 14

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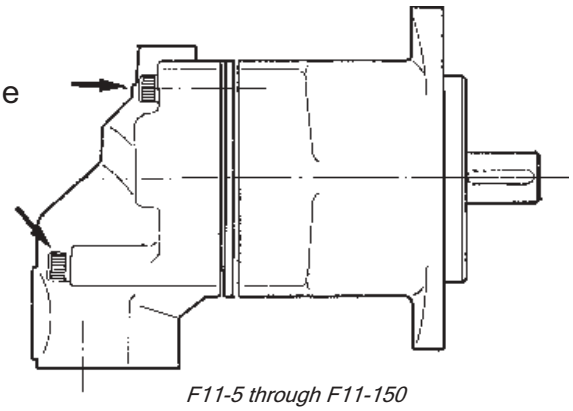
- F11-250 15

Specifications

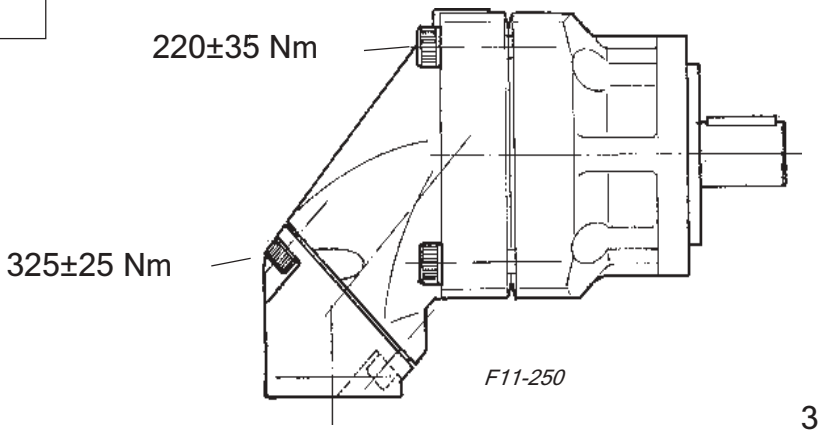
Designation	F11-5	F11-10	F11-19	F11-28	F11-39	F11-58	F11-78	F11-110	F11-150	F11-250
Displacement (cm^3/rev)	4.88	9.84	19.0	28.1	38.7	58.2	78.2	110	150	242
Operating pressure										
Peak (bar)	420	420	420	420	420	420	420	420	420	420
Max continuous (bar)	350	350	350	350	350	350	350	350	350	350
Operating speed (rpm)										
Max	12000	10000	7500	6500	5200	4500	3500	3300	3000	2700
Max continuous	8500	6800	5400	5000	4200	3600	3100	2800	2600	2400
Min continuous	200	200	150	150	125	125	100	100	100	100
Power output										
Max (kW)	18	28	45	58	72	95	120	150	200	300
Continuous (kW)	13	20	32	40	52	68	85	110	145	190
Flow (litres/min) at 1000 rpm (theoretical)	4.88	9.84	19.0	28.1	38.7	58.2	78.2	110	150	242
Torque (Nm) at 100 bar (theoretical)	7.8	15.7	30.2	44.7	61.6	92.5	124	175	239	385

Screw Tightening Torque.

Series	Tightening torque (Nm)
F11 - 5	24±4
- 10	48±8
- 19	48±8
- 28	60±10
- 39	105±20
- 58	105±20
- 78	220±35
-110	220±35
-150	220±35
-250	See Fig.



F11-5 through F11-150



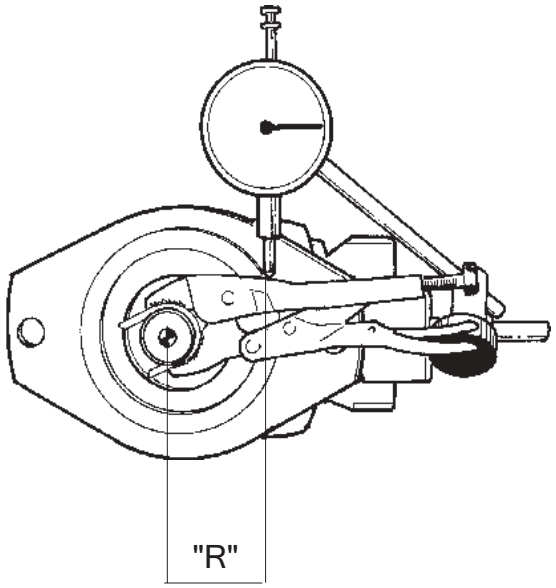
F11-250

Gear Backlash

F11-005 through F11-110
0.05 - 0.20 mm

F11-150 through F11-250
0.10 - 0.30 mm

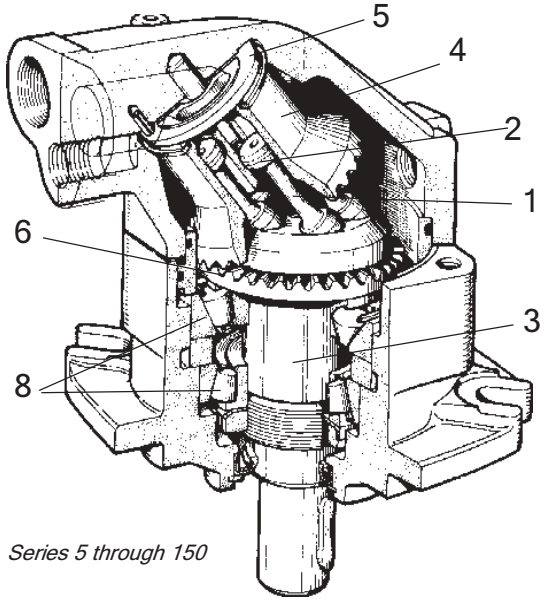
Frame size	mm
F11-005	25.0
F11-010	31.3
F11-019	37.5
F11-028	42.0
F11-039	47.5
F11-058	55.0
F11-078	62.5
F11-110	65.6
F11-150	75.0
F11-250	75.0



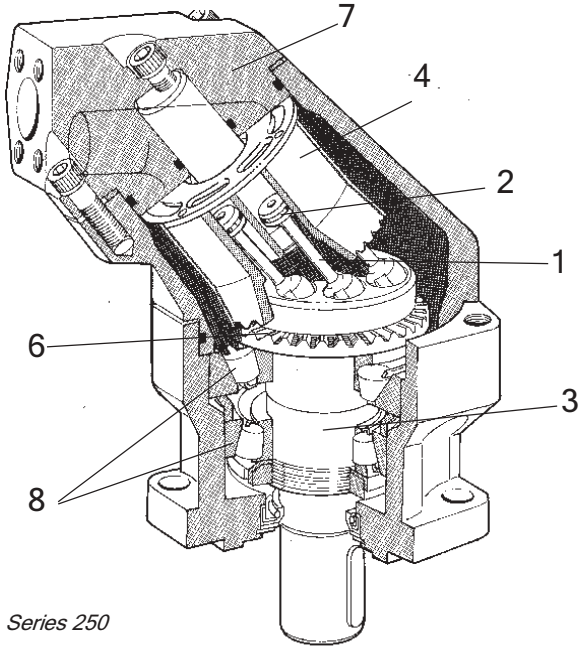
Design

Series F11 pumps/motors consist of a rotating group contained in a split housing. Spherical pistons (1) with laminated piston rings (2) operate at a 40° angle relative to the shaft (3). Series F11-5 through -78 employ five pistons, series F11-110 and -150 seven, and series F11-250 nine pistons. As the shaft turns, the pistons are driven in a reciprocating movement in the cylinder barrel (4). When the unit is used as a pump, the oil passes from the inlet port to the cylinder barrel and is then forced to the outlet port through the pumping action of the pistons.

A spring device (a retaining ring, a leaf spring, or Belleville washers) maintains the barrel against the valve plate (item 5, F11-5 through -150) or the end cap (item 7, F11-250). A ring gear (6) on the shaft meshes with the corresponding teeth of the barrel (4) so that the cylinder barrel always rotates at the same speed as the shaft (3). The shaft is supported by two heavy duty tapered roller bearings (8).



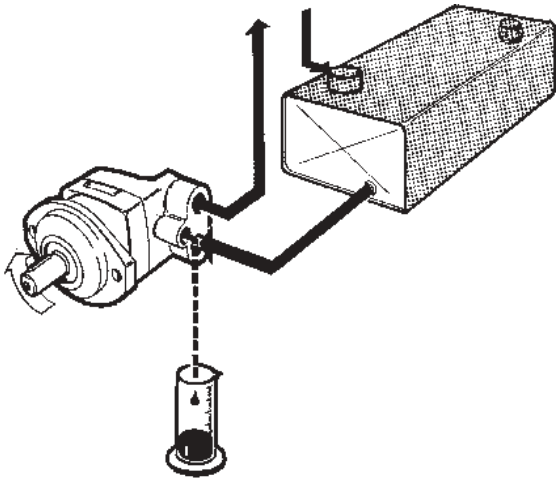
Series 5 through 150



Series 250

Operational Check

The general condition of the unit can be established by checking the drain flow. Remove the drain line and keep the drain port above a suitable container. Run the unit at normal speed and pressurize the system to 150 - 200 bar .



Measure the drain flow for one minute; if it exceeds the maximum figures shown below, the unit is worn or damaged internally and should be replaced or repaired. Also, check for leakage at the shaft seal and between the bearing and barrel housings.

Drain Flow

Series	Normal (l/m)	Max. (l/m)
F11-5	0.2	1.0
F11-10	0.3	1.5
F11-19	0.4	2.0
F11-28	0.4	2.0
F11-39	0.5	2.5
F11-58	0.7	2.7
F11-78	1.0	3.0
F11-110	1.0	3.0
F11-150	1.2	3.0
F11-250	1.5	3.0

Repair

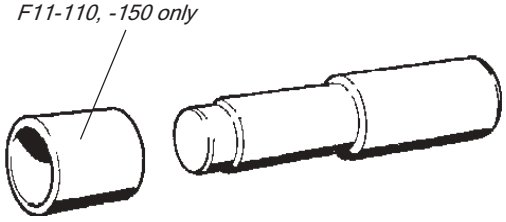
Tools and Supplies

Metric Allen keys, retaining ring spanners, and a torque wrench with suitable metric sockets are required for the disassembly and assembly of the F11 series, plus common hand tools.

In addition, the following tools are recommended for installing cylinder barrel needle bearings:

P/N 370 6526 (F11-110)
370 6527 (F11-150)
370 6528 (F11-250)

F11-110, -150 only



Needle bearing installation tool

A special tool, P/N 370 6250, is required for the removal and re-assembly of the F11-250 barrel post.

Barrel post installation tool

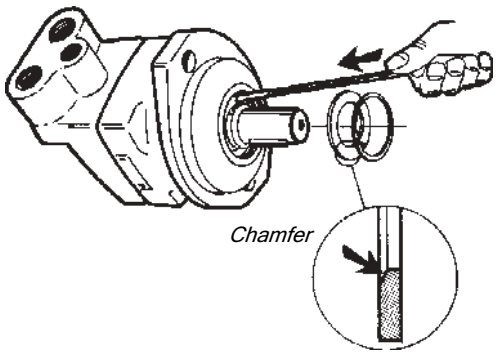
The following lapping compound can be used for reconditioning valve plates:

Time Saver 60 P/N 546 390 - 2400
Time Saver 80 P/N 546 390 - 3200

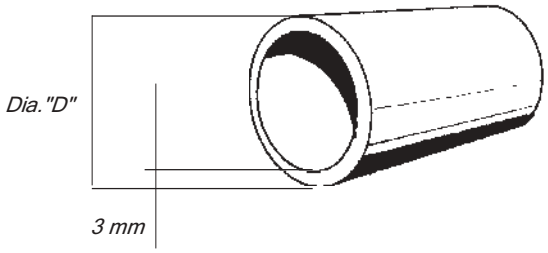
Shaft Seal Replacement

Note
The unit does not have to be taken apart.

Remove the retaining ring and the back-up washer (units designated F11C and F11D might not have a back-up washer). Without damaging the shaft, punch through the casing of the seal with a screwdriver and remove the seal. Check the shaft sealing surface for corrosion and other damage.



The tool shown in the figure can be used to facilitate the installation of the new seal. Be careful not to cut the seal on the shaft key or spline. The chamfer of the back-up washer should face the seal when installed (concerns N-seal).

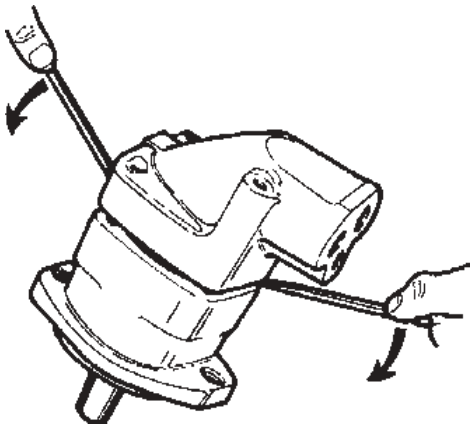


Series	Dia. "D" (mm)
F11- 5 10	35
19	52
28	62
39 58	65
78 110	72
150 250	80

Disassembly, Series F11-5 through -150

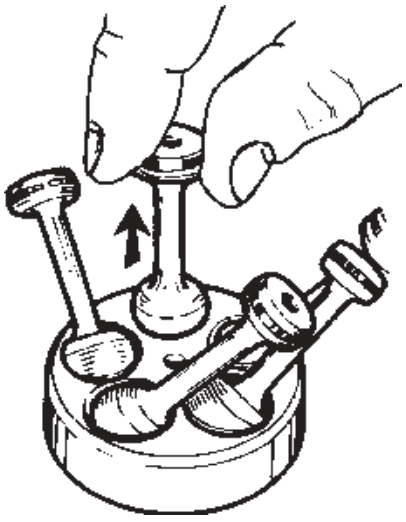
Before taking the unit apart, remove the shaft coupling (if applicable) and thoroughly clean the outside of the unit; seal the ports with suitable plugs or covers.

1. Remove the four metric cap screws. By utilizing two screwdrivers, pull the housings apart as shown. Retain the split shim located between the spacer ring and the barrel housing.

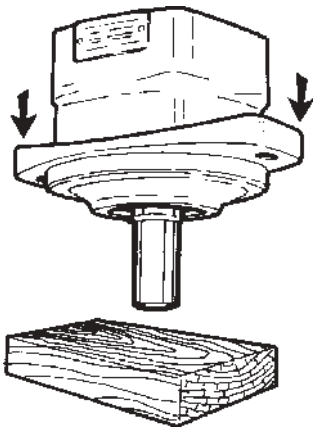


2. Mark the pistons and the corresponding ball sockets with a felt-tipped pen.

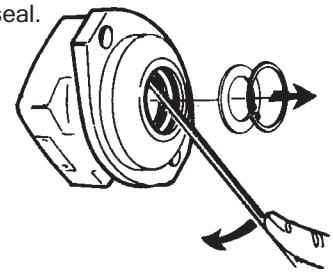
3. Remove the pistons by pulling them out when in line with the shaft as shown.



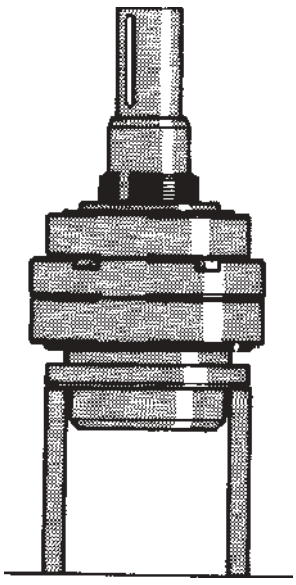
4. Using a bearing press, push the shaft assembly out of the bearing housing on a suitable support. The shaft assembly can also be removed by grasping the housing and carefully hitting the shaft against a wooden block as shown.



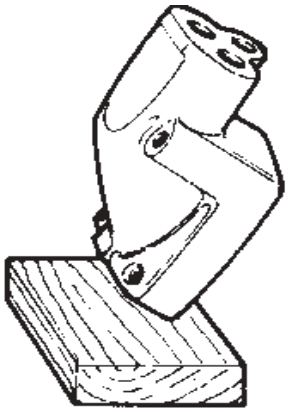
5. Remove the retaining ring, the back-up washer, and the shaft seal.



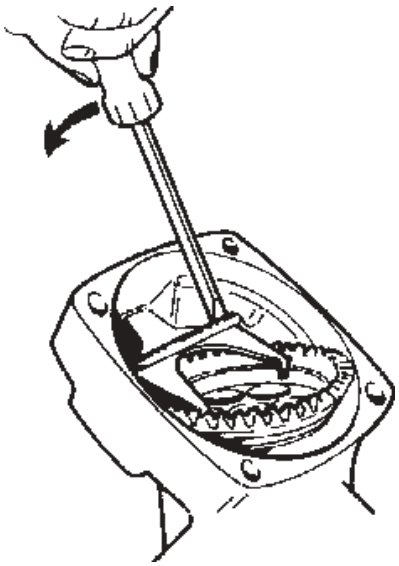
6. Do not disassemble the shaft assembly unless the bearings are worn or damaged. If the bearings or the shaft have to be replaced, remove the locknut and the tab washer, and position the shaft assembly on a piece of pipe or other suitable support that fits snugly around the shaft and supports the ring gear. The shaft can now be pressed out.



7. To remove the cylinder barrel from the housing (does not apply to Series F11-28 and -58), carefully hit the housing/barrel assembly against a piece of wood as shown; the barrel as well as the valve plate will be forced out. Be careful to protect the barrel and valve plate from damage.

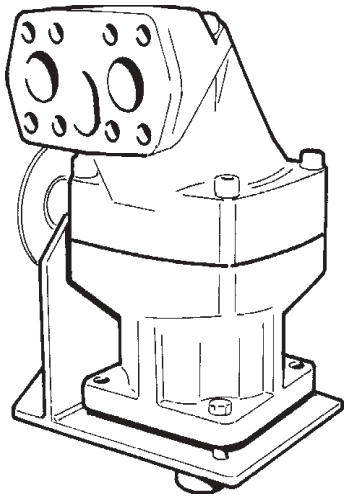


Series F11-28 and -58 cylinder barrel can be removed from the barrel post after removal of the leaf spring locating pin (utilizing a screwdriver as shown), the leaf spring, and the hold-down bearing ring.

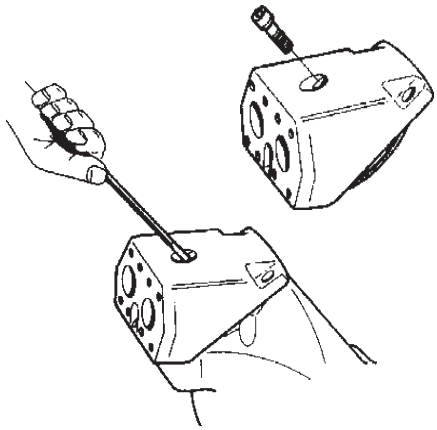


Disassembly, Series F11-250

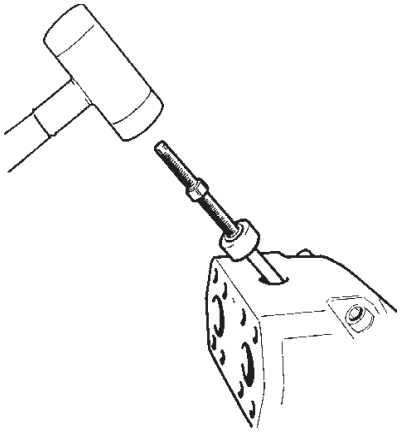
Position the unit on a table provided with a hole for the shaft or on a suitable fixture.



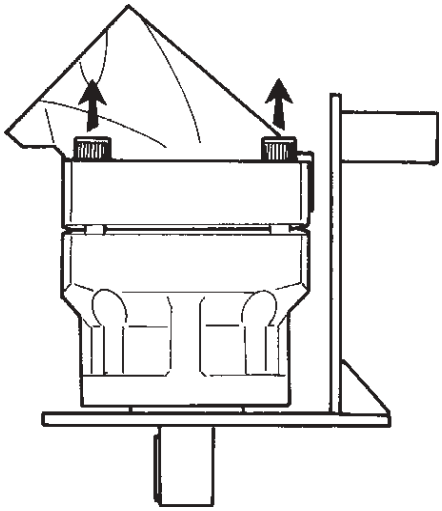
1. Remove the cap over the barrel post locating screw by forcing a screwdriver through the top of the cap and pulling it out. Remove the locating screw.



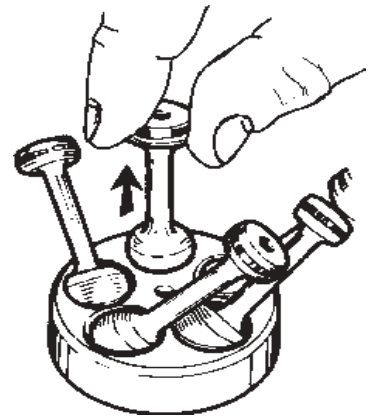
2. Insert tool P/N 370 6250 (without the sleeve) and knock the barrel post out of the end cap. Remove the three cap screws and the end cap. Retain the split shim located between the barrel housing and the end cap.

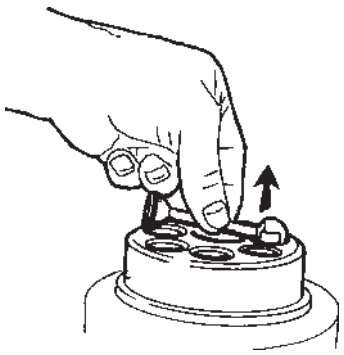


3. Remove the four cap screws and the barrel housing. Remove the cylinder barrel off the pistons.



4. With a felt-tipped pen, mark the pistons and the corresponding shaft sockets so that the pistons can be re-installed in their original positions. Hold the pistons as shown and lift them out.





Older version F11-250

5. Using a bearing press, push the shaft assembly out of the bearing housing while positioning the housing on a suitable support. The shaft assembly can also be removed by grasping the housing and carefully hitting the shaft against a wooden block.

Reconditioning and Replacement of Parts

After disassembly, all parts should be thoroughly cleaned in a suitable solvent.
Caution: Follow directions for use of solvent carefully.Protect your hands and eyes from the solvent.Solvent may also be inflammable.

If leakage of the F11 unit was too high, the following parts are generally worn or damaged:

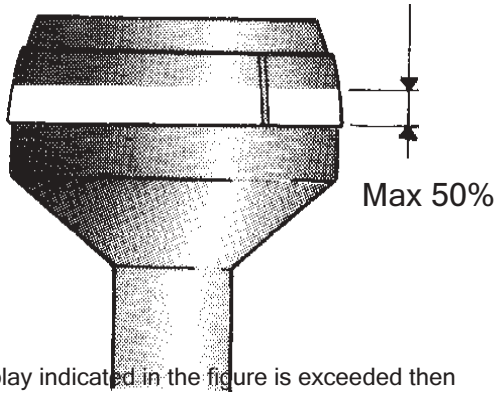
Series F11-5 through -150:
- Valve plate
- Cylinder barrel port surface (facing valve plate)
- Piston rings

Series F11-250:
- Bearing plate
- End cap port surface (facing bearing plate)
- Piston rings

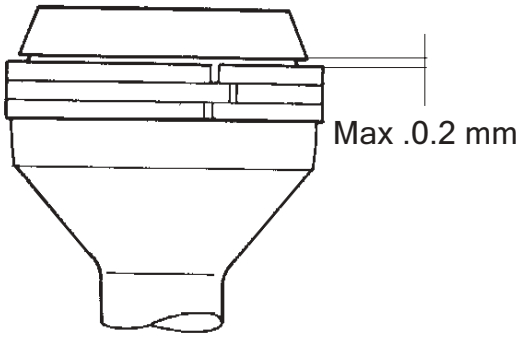
Scratches and wear marks on these parts always affect the performance of the unit; they should be replaced if scratched or worn.

1. Shaft seal and o-rings should always be replaced.

2. Replace spherical piston rings that are worn more than 50 % of the spherical surface as shown. A small retaining ring pliers will facilitate the removal. When installing a new piston ring, make sure the spherical surface coincides with the shape of the piston head.



If play indicated in the figure is exceeded then replace all piston and ring assemblies in the unit. Never replace individual worn piston and ring assemblies.



Production of the spherical piston ring is discontinued. The old ring and piston has to be replaced by the laminated version.

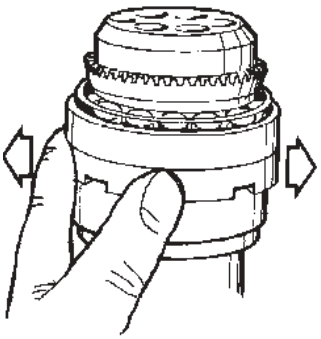
3. On series F11-5 through -150, the valve plate surface can be reconditioned by careful lapping. Use 'Time Saver' (refer to page 5).

Series F11-250 end cap port surface can be lapped but the bearing plate must be replaced if worn.

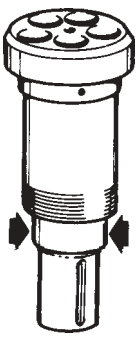
Note

When lapping the valve plate, up to .002 in. can be removed. If .002 in. is not sufficient to obtain a flat surface free of scratches, the part should be replaced.

4. If the bearing cups are loose, the shaft lock nut should be tightened. Correct bearing pre-load has been obtained when the spacer ring can be moved sideways without being loose. Note, for the bigger units quite a substantial force is required.



5. Check that the shaft surface in contact with the shaft seal is in good condition; if grooved, corroded, or otherwise damaged, the shaft should be replaced.

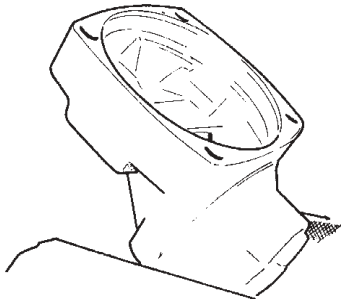


Reassembly, Series F11-5 through -150

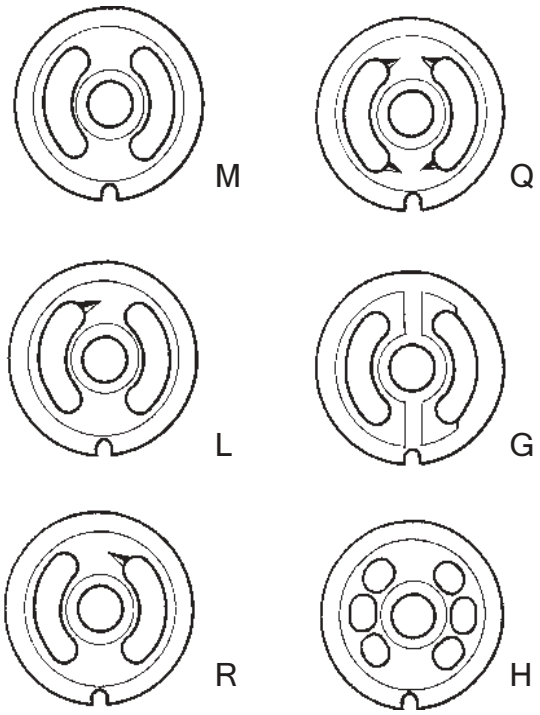
All parts should be thoroughly cleaned and lightly lubricated with hydraulic fluid. Reassembly is carried out in reverse order of disassembly.

Caution: Follow directions for use of hydraulic fluid carefully. Protect your hands and eyes from fluid. Fluid may also be flameable.

1. Place the cylinder barrel housing in a vice as shown.



2. Install the valve plate making sure it is seated properly in the housing; when installed correctly, the visible face of the valve plate should appear as shown.



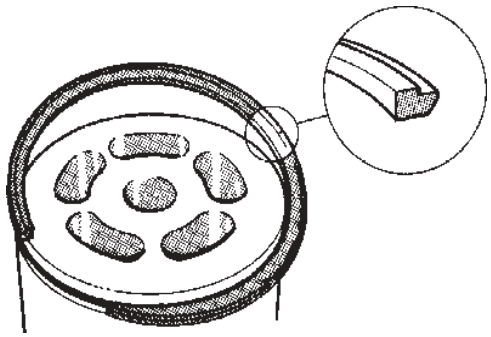
The internal drain valve plate G is shown from the back side of the plate. From the front, when installed, it looks the same as the M plate.

The following valve plates are available (designation appears on the nameplate):

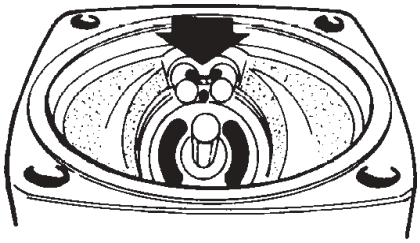
M = Bi-directional, motor or pump operation
L = L.H. rotation, pump operation
R = R.H. rotation, pump operation
G = L.H. rotation, internal drain, motor operation
J = R.H. rotation, internal drain, motor operation
H = Bi-directional, motor operation, high pressure
Q = Bi-directional, motor operation, low noise

3. The cylinder barrel retaining ring (does not apply to Series F11-28 and -58) should be installed as illustrated below. When installing the barrel in the housing, the opening of the retaining ring should face the housing cut-out as shown; the barrel has to be pushed down to overcome the spring force of the retaining ring.

Some resistance should be felt when trying to turn the cylinder barrel by hand; if no resistance is felt, the retaining ring must be replaced.



Drain port

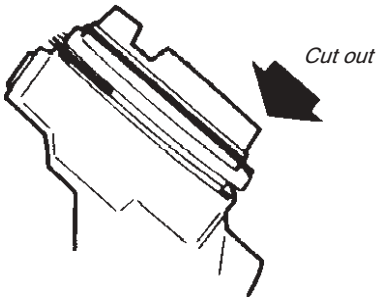


Note

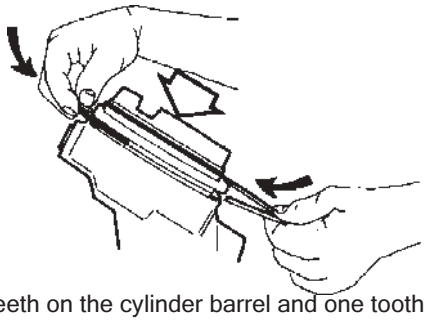
Regarding installation of needle bearings in F11-110 and -150 cylinder barrels, refer to page 16.

4. Series F11-28 and -58 utilize a leaf spring for barrel hold-down. Install the cylinder barrel on the barrel post, install the hold-down ring and the leaf spring, and secure the spring with the locating pin.

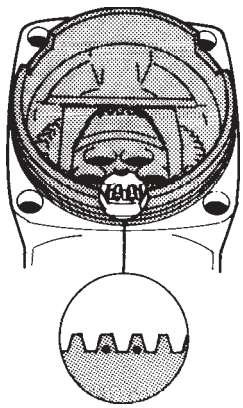
5. Install the guide spacer (with new o-rings) to the barrel housing; make sure one of the cut-outs is in the position shown, and leave room for the split shim between the spacer and the housing .



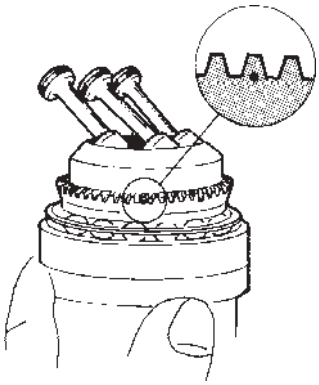
6. Install the split shim as illustrated. Make sure the shim is properly located in the barrel housing recess. Correct thickness of the shim should result in a gear backlash of .05 to .15 mm. If any part of the rotating group has been replaced, it might be necessary to change to a shim of different thickness; backlash is checked according to paragraph 12 (page 12).



7. Two teeth on the cylinder barrel and one tooth on the ring gear are marked to ensure that the pistons are in line with the cylinder bores. Position the cylinder barrel so that the markings are visible in the spacer cut-out as shown, this assures correct timing of the shaft and the cylinder barrel.

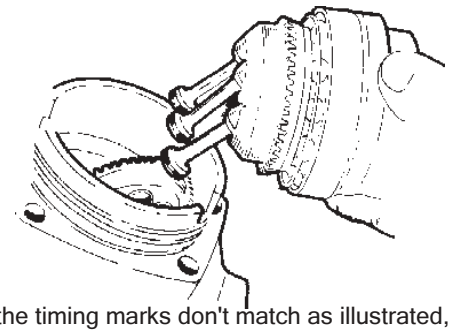


8. Locate the marked tooth of the shaft ring gear.

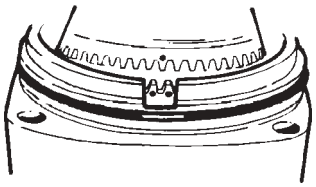


Note
If the shaft assembly has been taken apart, refer to "Reassembly, Series F11-250" for instructions.

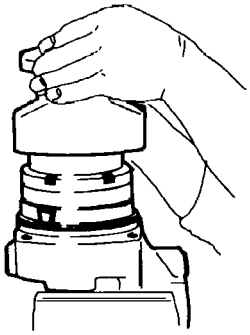
9. Position the shaft/piston assembly over the housing/barrel assembly as shown, so that the timing marks of the ring gear and cylinder barrel are lined up. Locate each piston into the corresponding, previously marked cylinder bore.



10. If the timing marks don't match as illustrated, carefully pull the shaft assembly out of mesh with the ring gear and reposition correctly.



11. Install the bearing housing with a new shaft seal on the shaft/bearing assembly, being careful not to cut or otherwise damage the seal. Cross-torque the cap screws according to specifications on page 3.

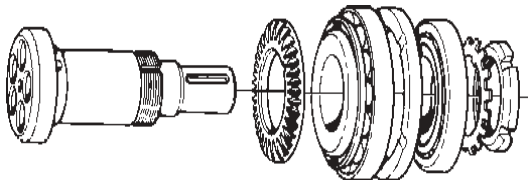


12. Turn the shaft by hand to assure correct assembly. A "clicking" noise generated when the shaft is rapidly turned back and forth reveals that there is backlash between the ring gear and the cylinder barrel. A "no noise" condition indicates no backlash, and a thicker shim has to be installed.

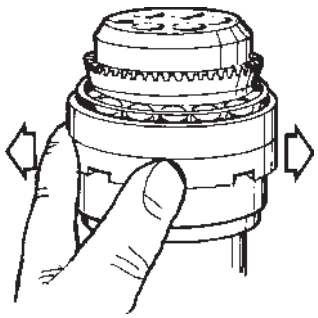
The correct backlash should be .05 to .15 mm.

Reassembly, Series F11-250

1. If the shaft/bearing assembly has been taken apart, start the reassembly by installing the ring gear over the locating dowel pin. Press the cone of the large roller bearing against the ring gear. Install the large bearing cup, the spacer ring (note the position of the cut-outs), and the small bearing cup. Press the small bearing cone onto the shaft, but only so far that the spacer ring can still be moved sideways easily.



2. Install a new tab washer and tighten the lock nut gradually until the spacer ring between the bearing cups is held firmly but not tight; you should be able to push the spacer sideways with your thumbs as shown. Secure the nut with one of the tabs of the washer.

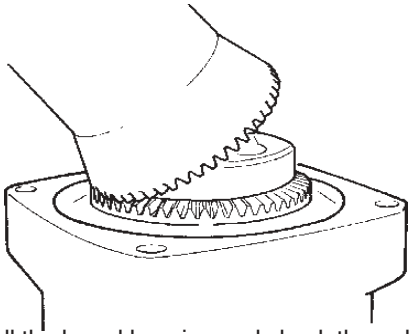


Note

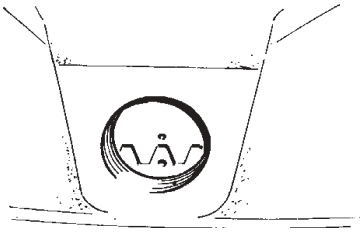
If the lock nut has been tightened too much as to allow the spacer to be moved sideways, the bearings have to be removed from the shaft and the assembly procedure started over again.

3. Install a new shaft seal and push the shaft assembly into the bearing housing. Install the pistons in the ball sockets.

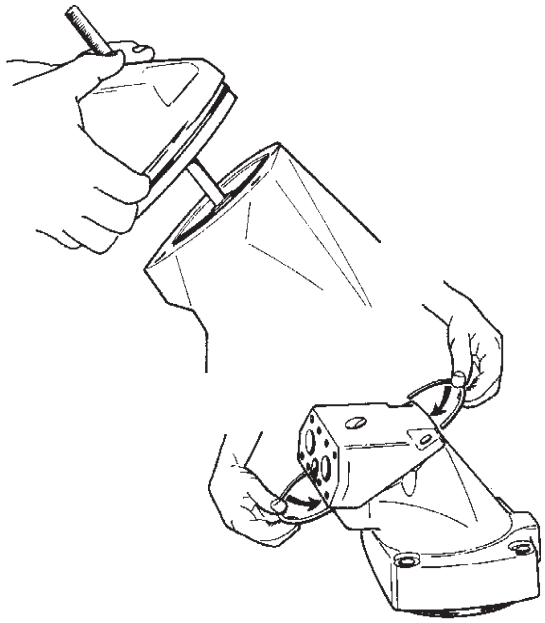
4. If a new cylinder barrel is used, install the groove pins that locate the bearing plate, the internal retaining ring, and the needle bearings (refer to page 14). Install the barrel post/bearing assembly in the cylinder barrel. Locate each piston into the corresponding, previously marked cylinder bore, and position the cylinder barrel assembly on the ring gear as shown so that the timing marks are lined up.



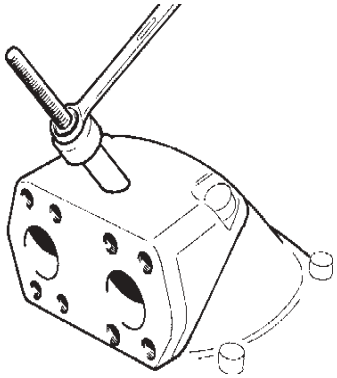
5. Install the barrel housing and check through the drain port that the timing is correct. Cross-torque the cap screws according to specifications (page 3).



6. Install new o-rings on the end cap; one o-ring is located in the barrel post bore. Screw tool P/N 370 6250 (without nut and bearing) into the barrel post, and install the end cap over the tool spindle against the block housing. Install the split shim as shown, making sure it is located correctly in the barrel housing recess.



7. Install the nut/bearing of the tool on the spindle, and , by tightening on the nut,pull the barrel post partly into the end cap. Install the three cap screws and tighten according to specification (page 3).



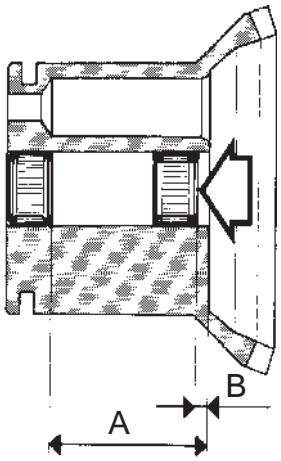
8. By further tightening on the nut, pull the block post completely into the end cap; do not overtighten.

9. Remove the assembly tool. Install the cap screw that secures the barrel post, and torque it to .40-.45 Nm; back off 1/3 turn to obtain correct axial play. Push the seal cap over the screw head.

10. Check the backlash through the drain port; correct backlash is .10-.30 mm.

Needle Bearing Installation

F11-110, -150

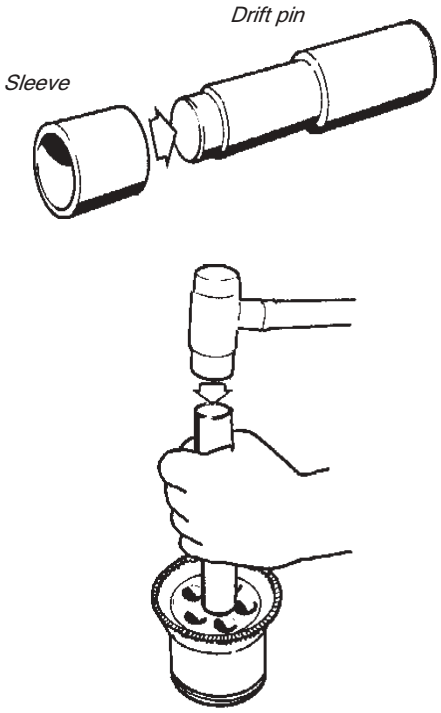


Series	Dim. A mm	Dim. B mm
F11-110	56.0	4.5
F11-150	61.5	10.0

Refer to page 5 for information on recommended tools.

Note

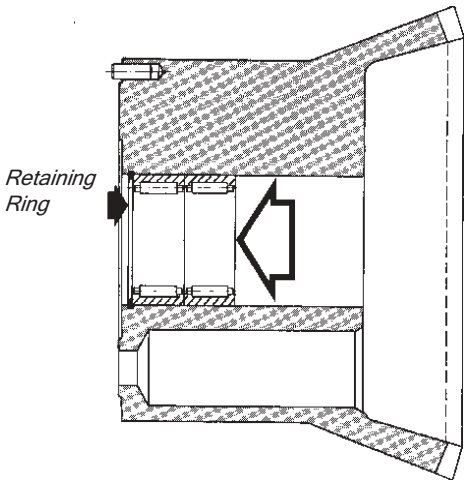
When installing the needle bearings, the marked end of the cage should face the drift pin or sleeve.



1. Install the sleeve and a needle bearing on the drift pin; press the bearing to the bottom of the cylinder barrel (dimension A).

2. Remove the sleeve, install the second needle bearing on the drift pin and press in place (dimension B).

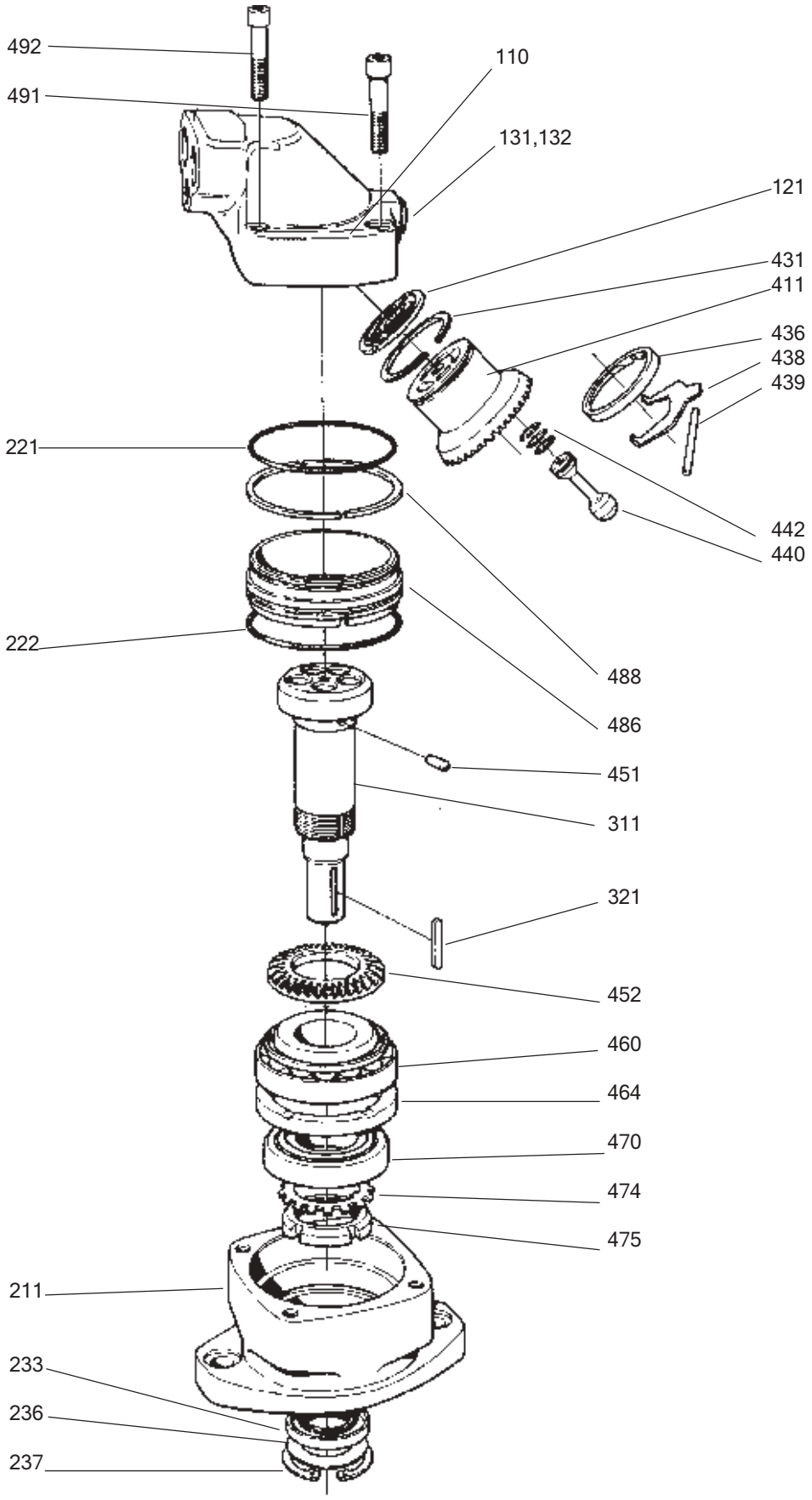
F11-250:



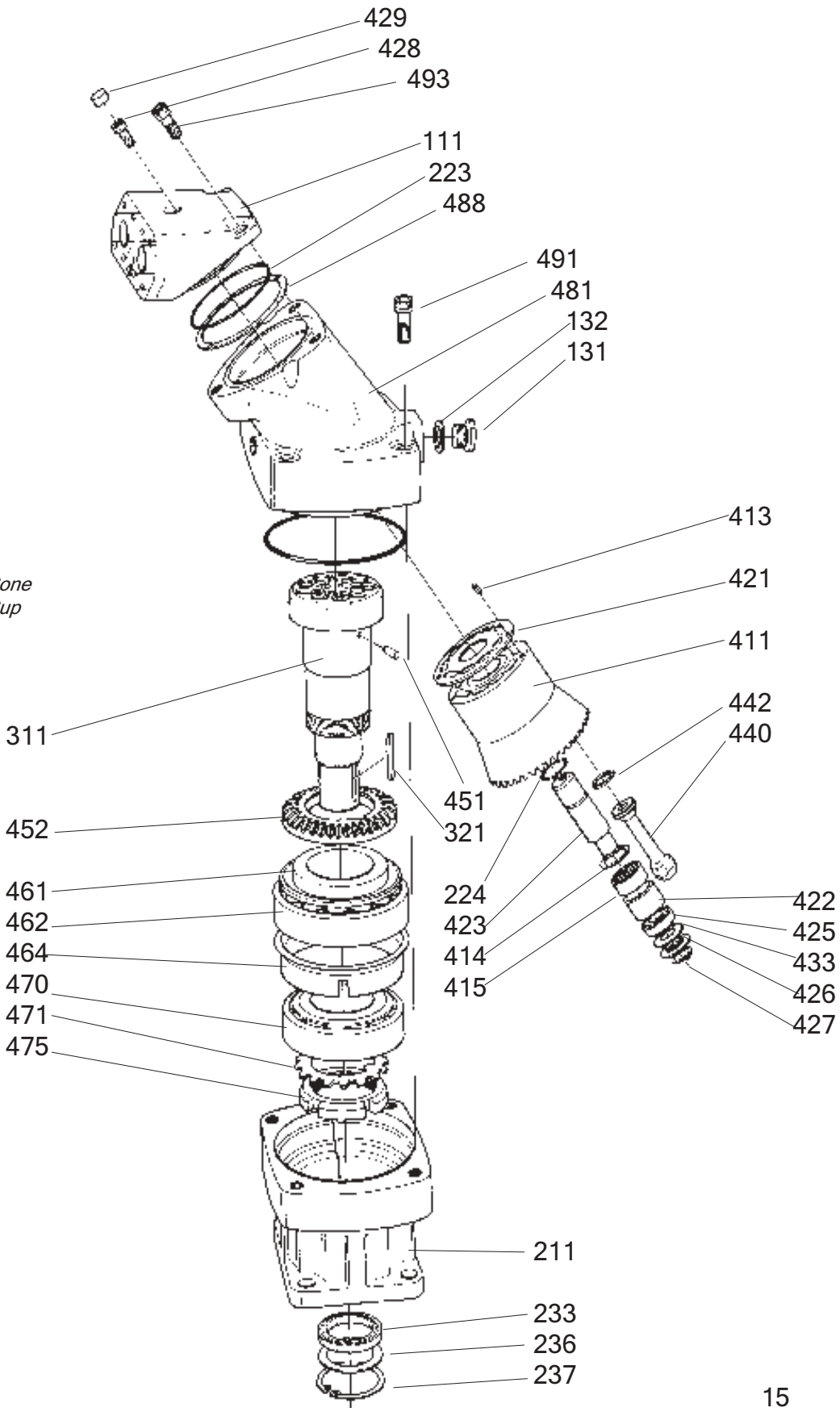
1. Install a needle bearing on the drift pin (there is no sleeve); press in place so that it just touches the retaining ring.

2. The second needle bearing should be located against the one previously installed.

Item	Title
110	Barrel Housing Assy
121	Valve Plate
131	Hex Socket Plug
132	Seal Washer
211	Bearing Housing
221	O-Ring
222	O-Ring
233	Shaft Seal
236	Back-up Ring
237	Retaining Ring
311	Shaft
321	Flat Key
411	Cylinder Barrel
415	Needle bearing
431	Barrel Retaining Ring
436	Bearing Ring
438	Leaf Spring
439	Pivot Pin
440	Piston Assy
442	Piston Ring
451	Pin
452	Ring Gear
460	Taper Roller Bearing
464	Spacer Ring
470	Taper Roller Bearing
474	Lock Washer
475	Round Nut
486	Guide Spacer
488	Shim
491	Hex Socket Screw



Item	Title
111	End Cap
131	Hex Socket Plug
132	Seal Washer
211	Bearing Housing
222	O-Ring
223	O-Ring
224	O-Ring
233	Shaft Seal
236	Back-up Ring
237	Retaining Ring
311	Shaft
321	Flat Key
411	Cylinder Barrel
413	Spring Pin
414	Retaining Ring
415	Needle Bearing
422	Spacer Sleeve
423	Barrel Spindle
424	Sliding Plate
425	Taper Roller Bearing
426	Spacer Washer
427	Retaining Ring
428	Hex Socket Screw
429	Cap Plug
433	Disc Spring
440	Piston Assy
442	Piston Ring
451	Pin
452	Ring Gear
461	Taper Roller Bearing Cone
462	Taper Roller Bearing Cup
464	Spacer Ring
470	Taper Roller Bearing
474	Lock Washer
475	Round Nut
481	Barrel Housing
488	Shim
491	Hex Socket Screw
493	Hex Socket Screw



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Catalog 9129 8205-02
Februari 2001, GB

Service Manual
ASM 3.1 - F12
F12-030 until -110

Catalog 9129 8249-12
August 2003, GB

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General information

F12 is bent axis, fixed displacement heavy-duty motor/pump seris. They can be used in numerous applications in both open and closed loop circuits.

Series F12 conforms to current ISO and SAE mounting flange and shaft end configurations. A very compact cartridge version is also available.
Frame sizes: F12-30, -40, -60, -80 and -110.

Thanks to the unique spherical piston design, F12 motors can be used at unusually high shaft speeds. Operating pressures to 480 bar provides for the high output power capability.

The 40° angle between shaft and cylinder barrel allows for a very compact, lightweight motor/pump.

The laminated piston ring offers important advantages such as low internal leakage and thermal shock resistance.

The pump version has highly engineered valve plates for increased selfpriming speed and low noise, available with left and right hand rotation.

The F12 motors produce very high torque at start-up as well as at low speeds.

Our unique timing gear design synchronizes shaft and cylinder barrel, making the F12 very tolerant to high 'G' forces and torsional vibrations.

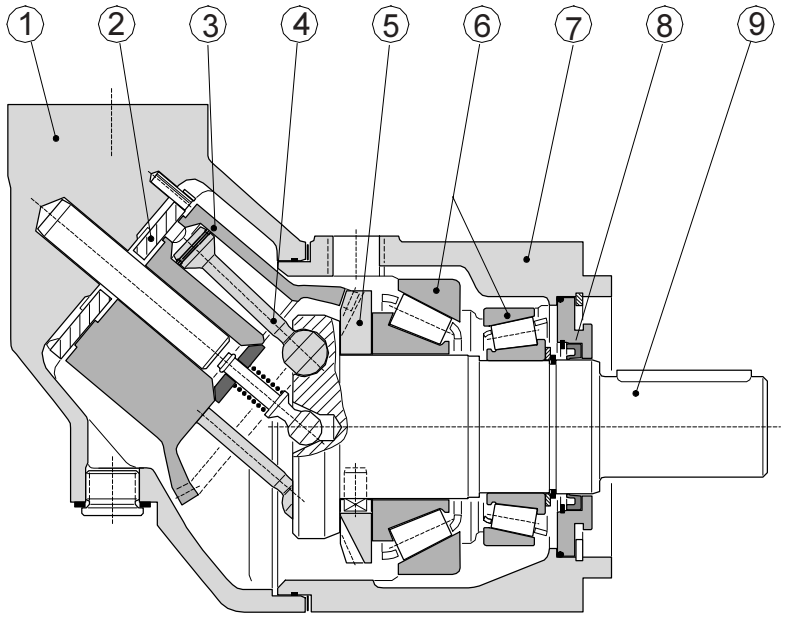
Heavy duty roller bearings permit substantial external axial and radial shaft loads.

The F12's have a simple and straightforward design with very few moving parts, making them very reliable motors/pumps.

The unique piston locking, timing gear and bearing set-up as well as the limited number of parts add up to a very robust design with long service life and, above all, proven reliability.

F12 cross section

1. Barrel housing
2. Valve plate
3. Cylinder barrel
4. Piston with piston ring
5. Timing gear
6. Tapered roller bearing
7. Bearing housing
8. Shaft seal
9. Output/input shaft



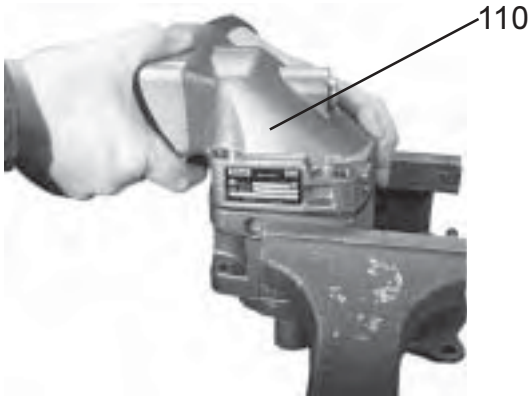
Specifications

Frame size	F12-30	-40	-60	-80	-110
Displacement [cm³/rev]	30.0	40.0	59.8	80.4	110.1
Motor operating speed [rpm]					
max intemittent	7 100	6 400	5 600	5 200	4 700
max continuous	5 600	5 000	4 300	4 000	3 600
min continuous	50	—	—	—	50
Max pump selfpriming speed[1]					
L or R function; max [rpm]	2 850	2 650	2 350	2 350	2 200
Torque (theor.) at 100 bar [Nm]	47.6	63.5	94.9	128	175
Motor input flow					
max intemittent [l/min]	213	256	335	418	517
max continuous [l/min]	168	200	257	322	396
Output power (motor)					
max intemittent [kW]	110	130	175	220	270
max continuous [kW]	70	85	110	153	165
Operating pressure					
max intemittent [bar]	480	—	—	—	480
max continuous [bar]	420	—	—	—	420
Max case pressure					
shaft seal type H, 1500 rpm [bar]	14	12	12	10	9.5
Main circuit temp., max [ºC]	80	—	—	—	80
min [ºC]	-40	—	—	—	-40
Fluid viscosity, max. [mm²/s]	1 000	—	—	—	1 000
min. [mm²/s]	8	—	—	—	8
Fluid contamination level					
(ISO code 4406)	18/13	—	—	—	18/13
Mass moment of inertia					
($x10^{-3}$) [kg m²]	1.7	2.9	5.0	8.4	11.2
Weight [kg]	12	16.5	21	26	36

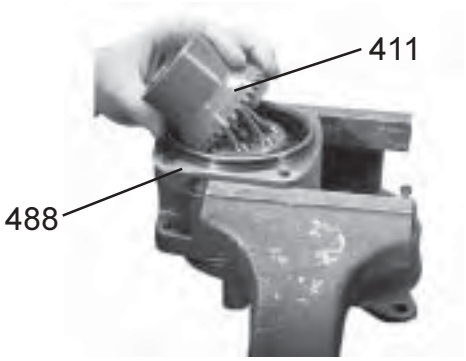
[1]) Valid at sea level.

Disassemble

Fasten the unit in a vice. Loosen the 4 boults (item 491).



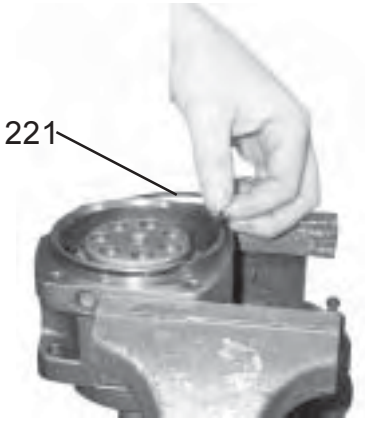
Lift off the barrel housing (item 110). Make sure that the valve plate doesn't fall out when lifting the barrel housing off.



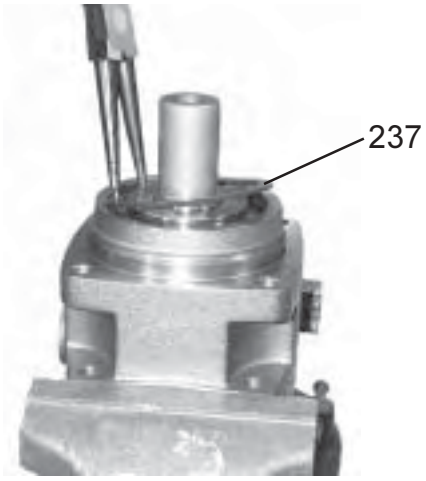
Lift off the cylinder barrel (item 411). Take the shim (item 488) away.

Lift off the barrel support (item 430).

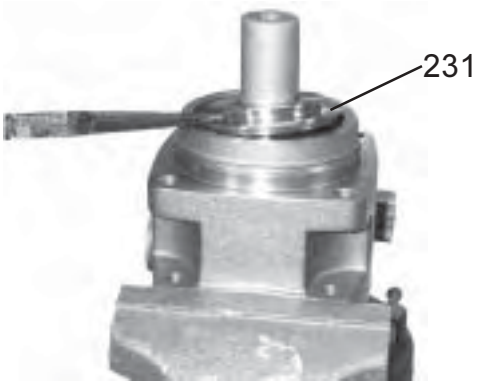
Remove the pistons (item 440).



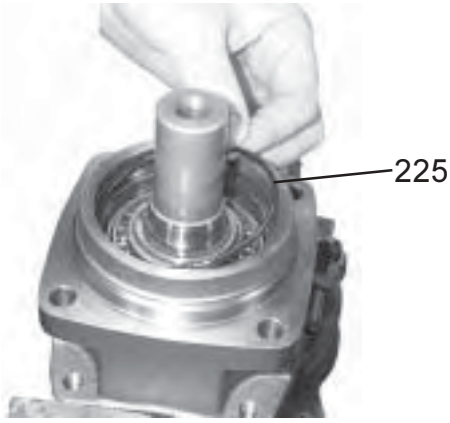
Remove the O-ring (item 221).



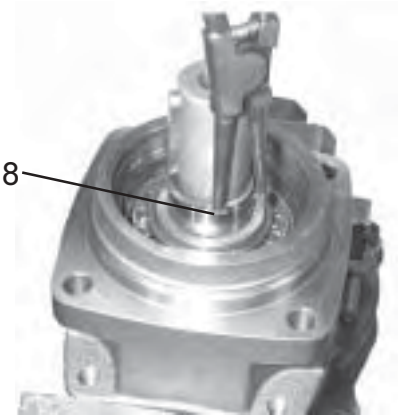
Remove the retaining ring (item 237).



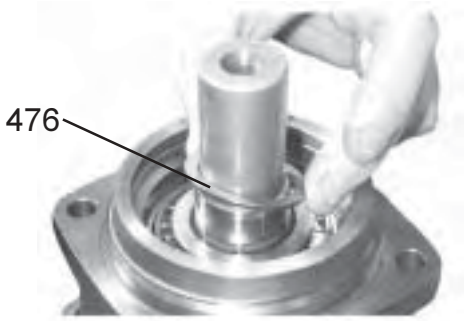
Remove the seal carrier (item 231).



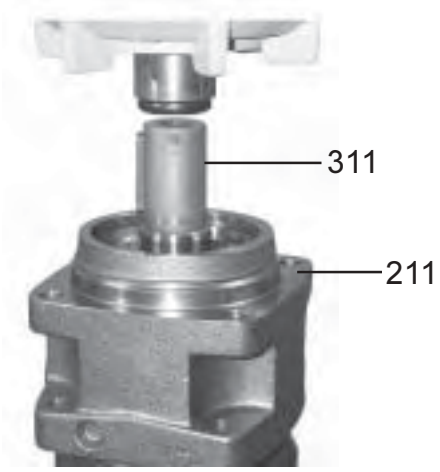
Remove the O-ring (item 225).



Remove the retaining ring (item 478).



Lift off the spacer washer (item 476).

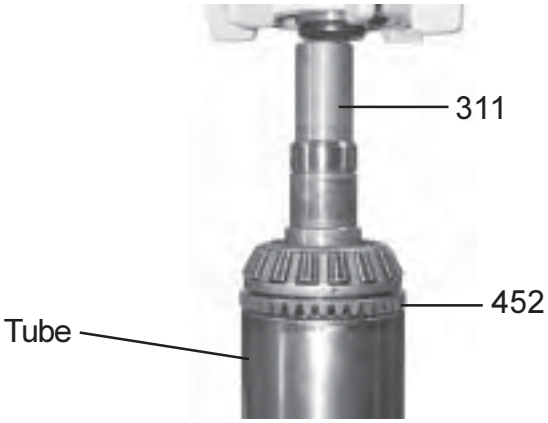


Place the bearing housing (item 211) on a tube.
Push out the shaft (item 311) with a press.

Remove the small tappered roller bearing (item 470).

Tap the small bearing ring off with a mandrel.

Tap the large bearing ring off with a mandrel.



Place the ring gear (item 452) on a tube.
Push out the shaft (item 311) with a press.

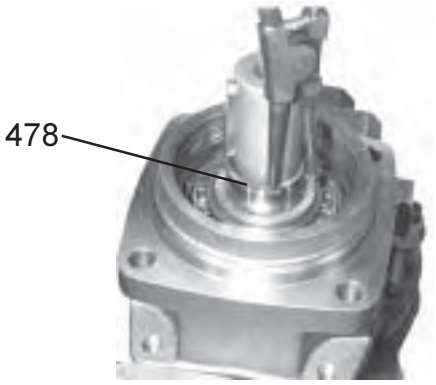
Assemble

Push on the tappered roller bearing (item 460) and the ring gear (item 452) on the shaft with a press. Use a tube (see page 16).

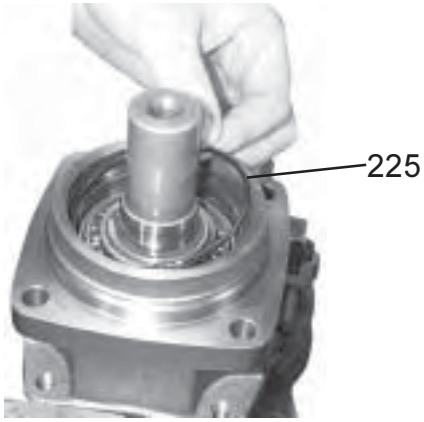
Push on the bearing ring (item 460) in the bearing housing (item 211) with a press. Use a tube to match the outer diameter off the bearing ring.

Push on the bearing ring (item 470) in the bearing housing (item 211) with a press. Use a tube to match the outer diameter off the bearing ring.

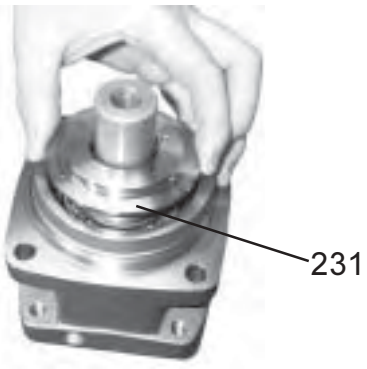
Push on the Bearing (item 470) with a press until correct preload is achieved. Install the spacer washer (item 476).



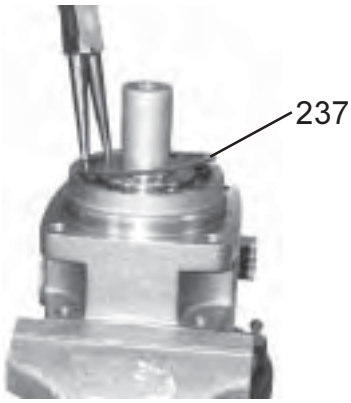
Install the retaining ring (item 478).



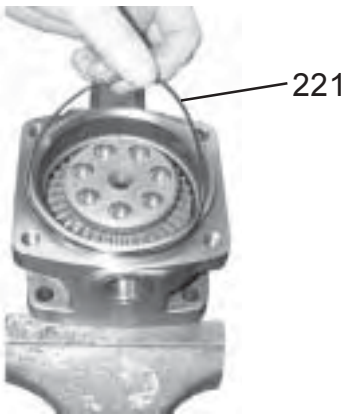
Install the O-ring (item 225).



Install the seal carrier (item 231).



Install the retaining ring (item 237).

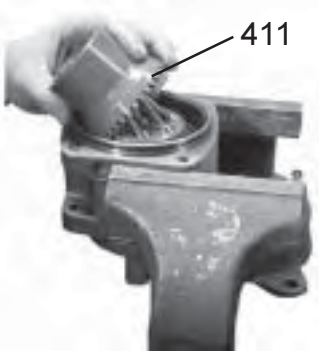


Install the O-ring (item 221).

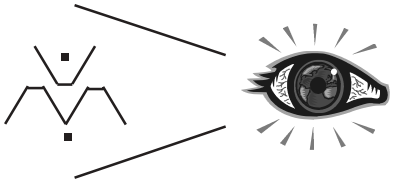
Install the pistons (item 440).

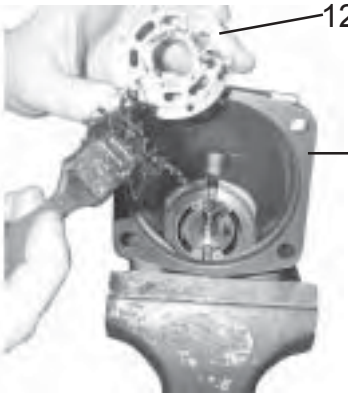
Install the barrel support (item 430).

Install the shim (item 488).

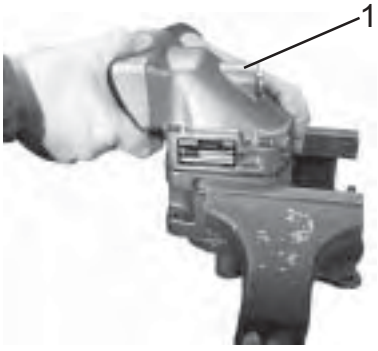


Install the cylinder barrel (item 411). Ensure correct timing. (Marking, punch mark)





Put some grease on the valve plate (item 121) and install it into the barrel housing (item 110).
Make sure you have installed the valve plate correct (see page 18).

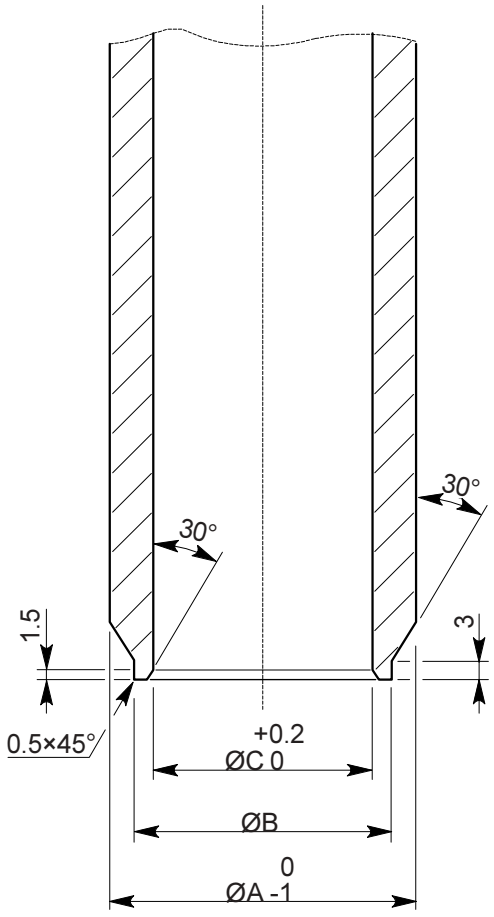


Install the barrel housing (item 110).

Fasten the 4 boults (item 491) to specified torque.

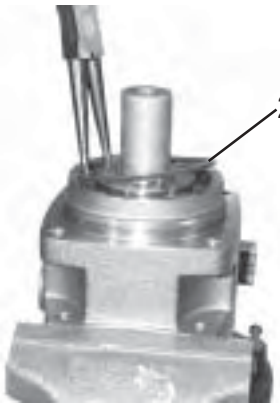
F12-030	60 ± 10 Nm
F12-040	60 ± 10 Nm
F12-060	60 ± 10 Nm
F12-080	105 ± 20 Nm
F12-110	105 ± 20 Nm

Tools to be used to facilitate the installation of the tappered roller bearings.

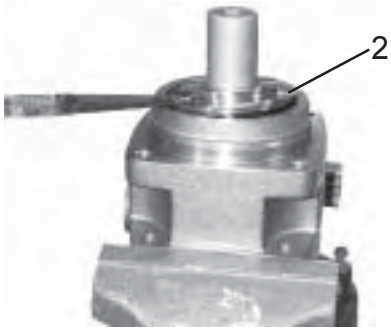


Type	ØA	ØB	ØC
F12-030	60	49	42
F12-040	65	58	52
F12-060	73	64	57
F12-080	74	70	62
F12-110	82	75	67

Change of shaft seal



Remove the retaining ring (item 237).



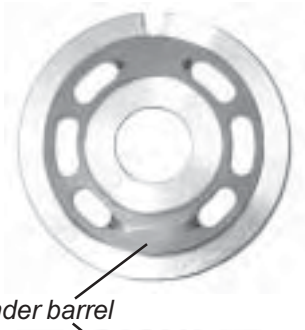
Remove the seal carrier (item 231).

Tap the shaft seal out with hammer and mandrel.

Tap the new shaft seal back with a tube and a hammer.
The outside diameter on the tube is 65mm.

Valve plates F12

Following valve plates can be fitted in F12.



M

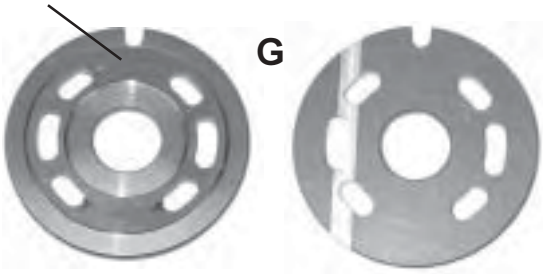
M = Bi-directional, motor operation

L

L = L.H. rotation, pump operation

R

R = R.H. rotation, pump operation



G

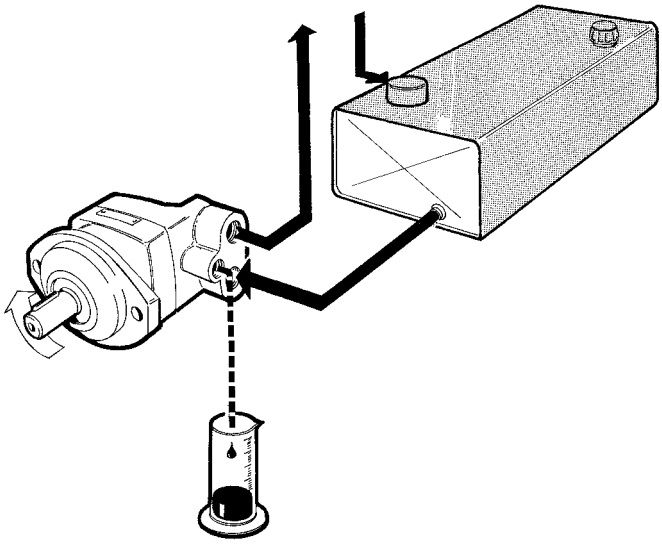
G = L.H. rotation, internal drain, motor operation

X

X = Bi-directional, pump operation, high self priming speed

Operational Check

The general condition of the unit can be established by checking the drain flow. Remove the drain line and keep the drain port above a suitable container. Run the unit at normal speed and pressurize the system to 2000-3000 psi. (150 - 200 bar)
Measure the drain flow for one minute; if it exceeds the maximum figures shown below, the unit is worn or damaged internally and should be replaced or repaired. Also, check for leakage at the shaft seal and between the bearing and barrel housings.



Series	Normal cu.in./min	(l/m)	Max gpm.	(l/m)
F12-30	24	0.4	.55	2.0
F12-40	30	0.5	.65	2.5
F12-60	43	0.7	.70	2.7
F12-80	61	1.0	.80	3.0
F12-110	61	1.0	.80	3.0

Hydraulic Motor/Pump Series F12

Please contact our sales representative:

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Tel +46 520 986 00
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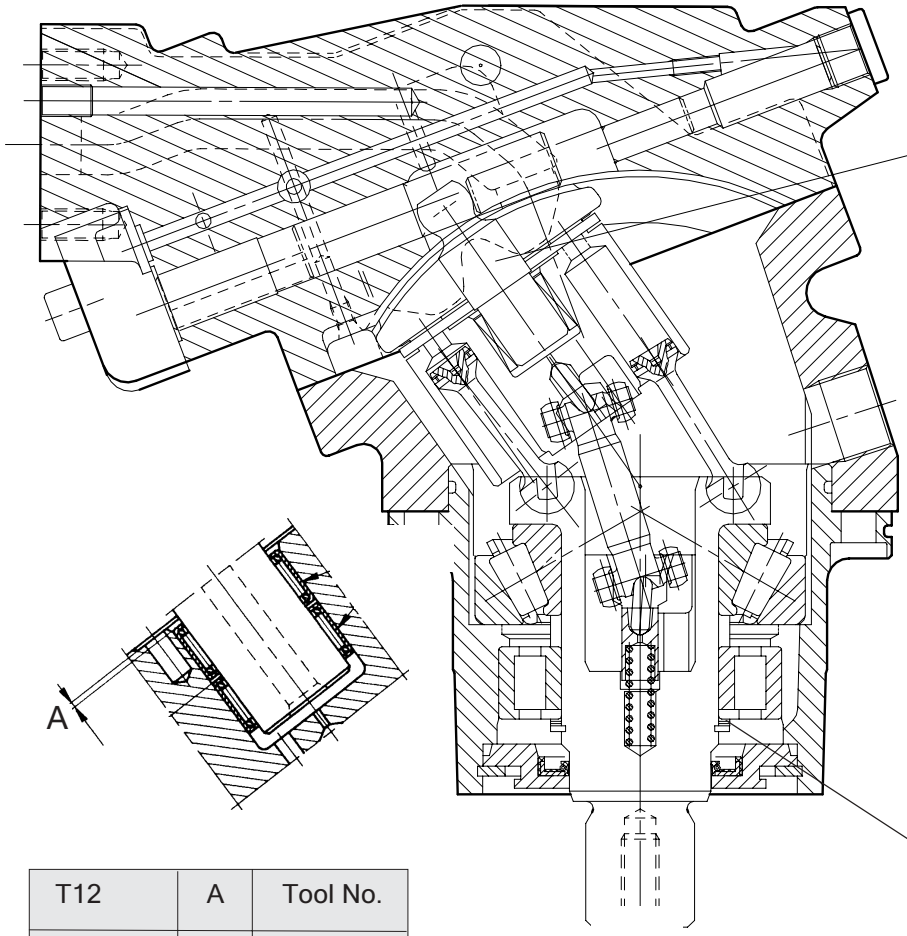
www.parker.com

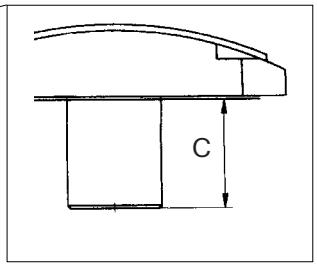
Catalog 9129 8249-12
August 2003, GB

Service Manual
ASM 3.1 -T12
T12-60 and -80

Catalog 9129 8212-19
Februari 1999, GB/DE/FR

Mobile Hydraulics



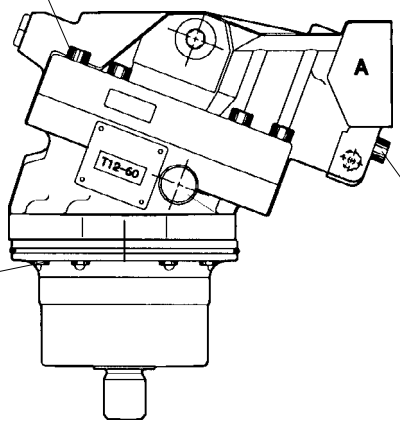


T12	C
T12-60 T12-80	26.5 28.5

T12	A	Tool No.
T12- 60 T12- 80	2 3.5	3793658 3793648

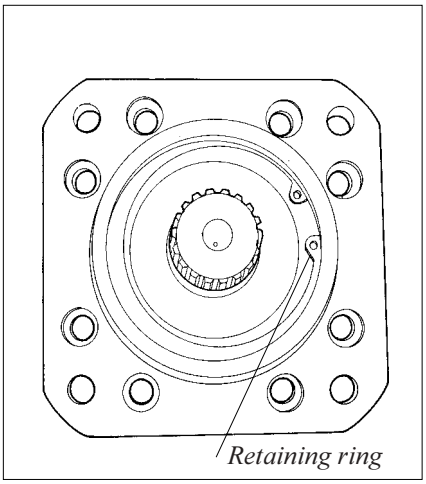
Clearance 0.0 - 0.1 mm

T12- 60	60 Nm
T12- 80	60 Nm

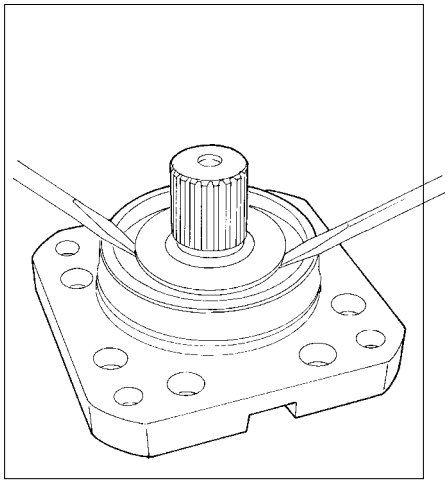


T12- 60	60 Nm
T12- 80	60 Nm

T12- 60	60 Nm
T12- 80	60 Nm



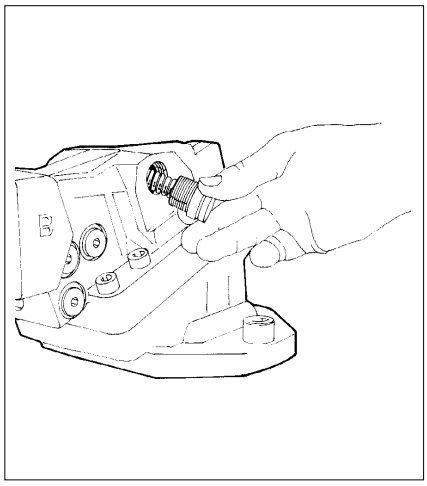
Replacement of Shaftseal	Wellendichtring-wechsel	Remplacement du joint d'arbre
Remove the retaining ring.	Den Sicherungsring entfernen	Oter le circlips



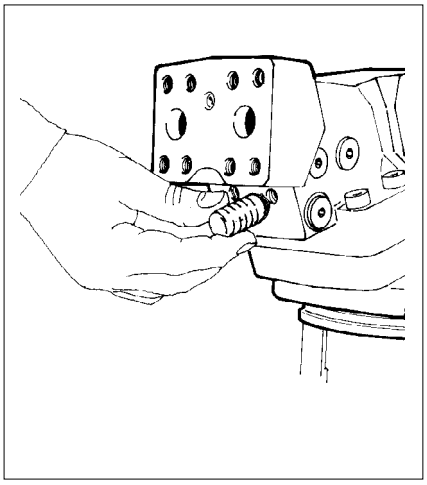
Pull out the seal carrier.
Remove the old seal ring, install a new seal ring and push the carrier back into the V12 motor.

Den Deckel unter Zuhilfenahme von zwei Schraubendrehern herausheben, den Wellendichtring wechseln und den Deckel wieder montieren.

Retirer le porte joint
Oter le vieux joint, mettre à la place le nouveau joint, pousser le porte joint dans le moteur et remettre le circlips.



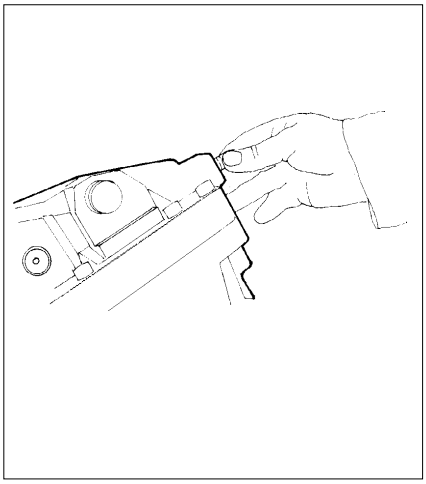
Adjustments	Einstellmöglich-keiten	Réglage
Position of pressure relief valve (if installed). These cartridges are not adjustable, they must be changed for different pressure settings.	Position der Schockventile (falls montiert). Die Ventileinsätze sind nicht einstellbar. Sie müssen für die gewünschten Druckstufen gewechselt werden.	Position des soupapes de sûreté (option). Ces soupapes ne sont pas réglables, elles doivent être changer selon les valeurs de tarage.



Position of setting piston , which also serves as a limition for max. dicplacement. (First remove the pilot valve cover).

Position des Stellkolbens; auch min Hubbegrenzung (Bei Bedarf den Stopfen entfernen).

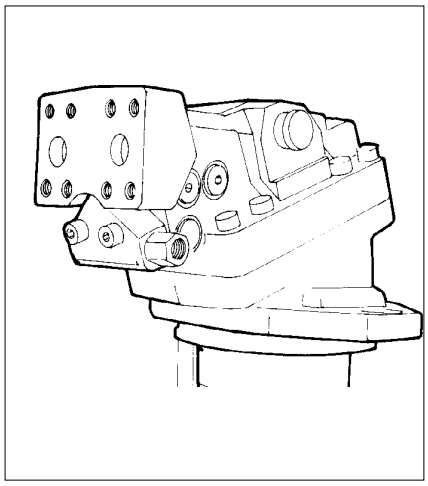
Démonter le couvercle de pilotag.
La position du piston de réglage, sert également de limitation pour la cylindrée maxi.



Position of setting piston, which also serves as a limitation for min. displacement. (First remove the plug).

Position des Stellkolbens; auch min Hubbegrenzung (Den Stopfen entfernen).

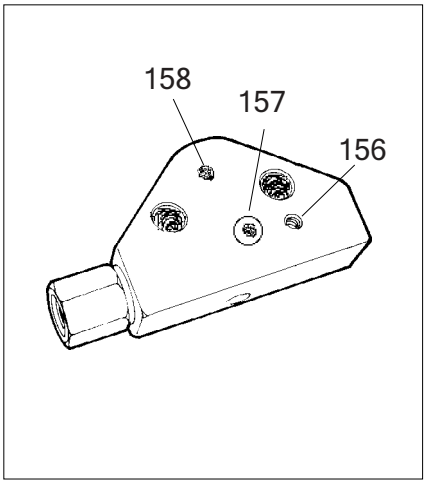
Démonter le bouchon .
La position du piston de réglage sert également de limitation pour la cylindrée mini.

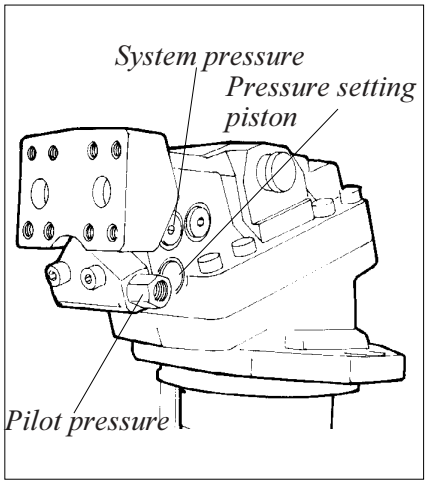


To adjust setting-time, remove the pilot valve cover.

Zur Veränderung der Verstellzeiten ist das Steuerventil abzunehmen.

Pour régler le temps de réponse, démonter le couvercle de pilotage.





The setting times for T12 is changed by installing different nozzles in the pilot valve cover.
Nozzle position 157 reduces setting time to booth max. and min. dicplacement.
Nozzle position 156 reduces setting time to max. displacement.
Nozzle position 158 reduces setting time to min. displacement.

Note, 156 is also the drain connection from the pilot valve, why too small nozzle in this position might influence the function of the pilot valve (the valve might stop operating, specially for low pilot pressure).

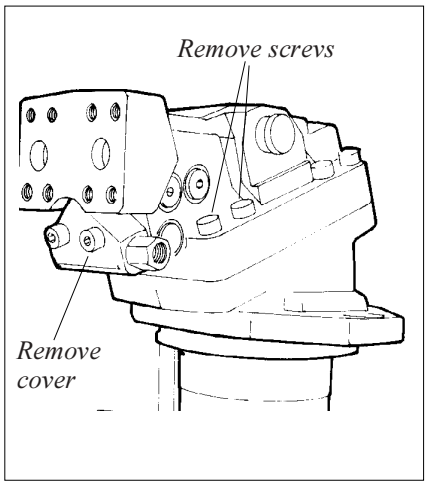
Die Verstellzeiten können durch entsprechende Drosseln im Steuerventil beeinflußt werden.
Drossel in Pos. 157 beeinflußt die Verstellzeiten in beiden Schwenkrichtungen.
Drossel in Pos. 156 beeinflußt die Aufregelzeit (min nach max). Drossel in Pos. 158 beeinflußt die Abregelzeit (max nach min)

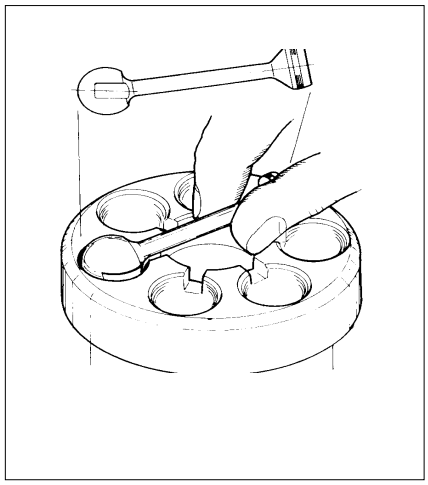
Achtung:
Eine zu kleine Drossel in Pos. 156 kann zum Blockieren des Steuerkolbens führen, insbesondere bei niedrigen Steuerdrücken.

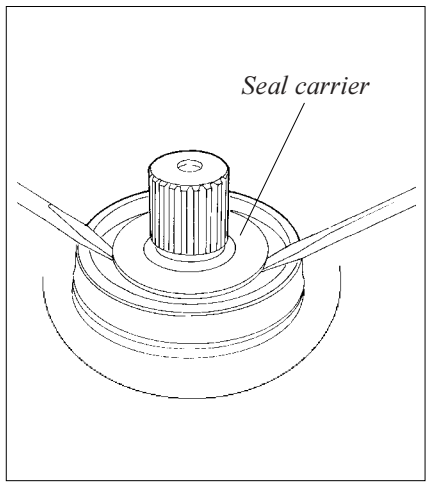
Le temps de réponse du T12 est modifie par la mise en place de gicleur dans le couvercle. Le gicleur 157 réduit le temps de réponse dans les deux sens de cylindrée, maxi et mini.
Le gicleur 156 reduit le temps de réponse dans le sens cylindrée maxi.
le gicleur 158 réduit le temps de réponse dans le sens cylindrée mini.

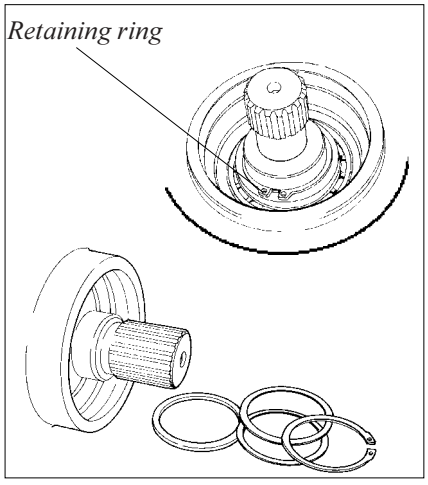
Remarque le gicleur 156 assure le drainage du tiroir de pilotage. Un gicleur trop petit peu influencer le fonctionnement de changement de cylindrée (en particulier pour des pressions de pilotage faible).

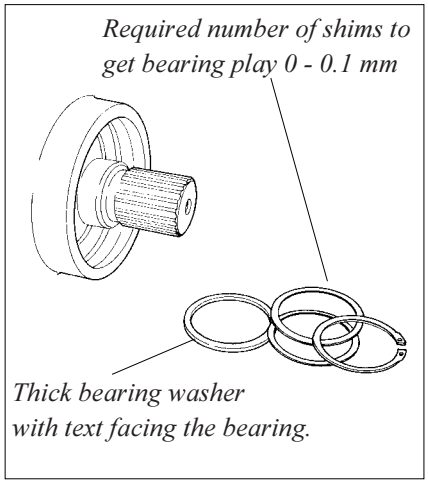
Dissasembly	Demontage	Démontage
Remove all screws holding the cover and regulator cover at the setting piston. Remove the covers. Remove the end-cap.	Die Befestigungs-schrauben der Deckel entfernen. Die Deckel abnehmen. Nach dem Ent-fernen der Befesti-gungsschrauben kann der Verstell-kopf abgehoben werden.	Oter toutes les vis maintenant les couvercles sur le carter du piston de commande, ôter les couvercles. Démonter le carter arrière.
Lift off the cylinder barrel, remove the joint with rollers and remove the pistons.	Die Kolbentrommel abheben und die Kolben, wie gezeigt, aus den Kalotten der Welle herausheben.	Retirer le barillet et ôter les pistons
Remove the retaining ring and pull out the seal carrier.	Die Flanschbe-festigungsschrauben entfernen. Den Flansch kpl. mit Welle aus dem Mittelgehäuse ziehen. Den Sicherungsring entfernen und den Deckel herausheben.	Oter les vis maintenant la bride avant. Retirer la bride et l'arbre équipé du carter. Oter le circlips et retirer le porte joint
Remove the retaining ring and the washers holding the bearings. Knock out the shaft with a plastic mallet. If the bearings have to be replaced they can be removed by knocking them out of the housing by using a drift. The bearing inner races on the shaft can be removed by using a press.	Den Sicherungsring und die Distanzscheiben entfernen. Die Welle mit einem geeigneten Kunststoffhammer herausschlagen. Lageraußenring und kleines Rollenlager können, falls erforderlich, mit einer Werkstattpresse oder Montagedorn entfernt werden	Oter le circlips et les rondelles maintenant les roulements. Sortir l'arbre en frappant avec un maillet en plastique. S'il est nécessaire de démonter les roulements, utiliser un jet et une presse.



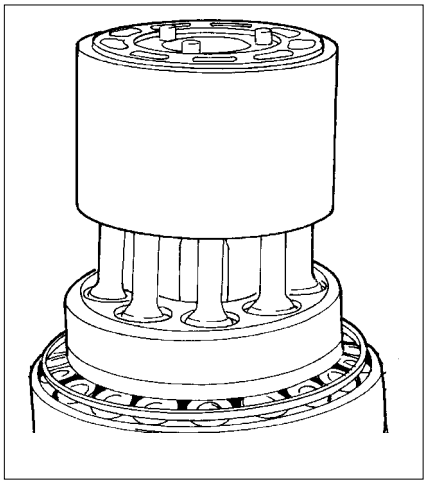




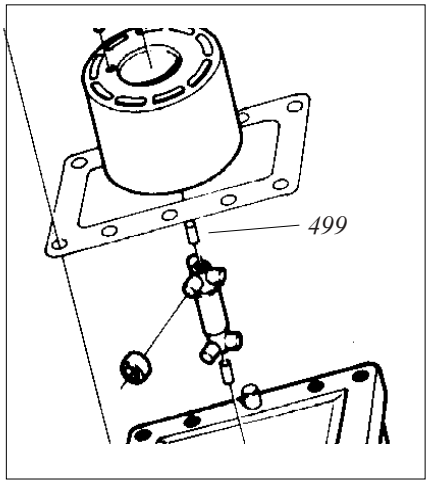




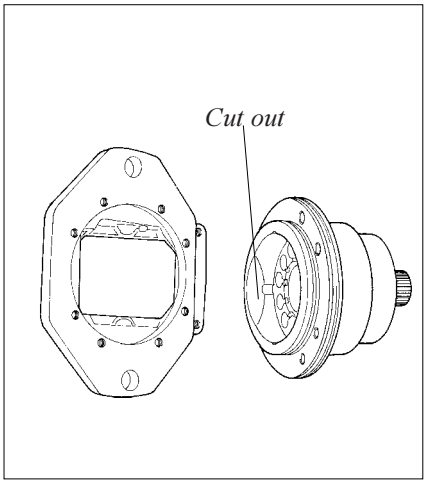
Reassembly	Montage	Remontage
The reassembly is started by installing bearing and shaft in the bearing housing.	Die Welle wird in den Befestigungsflansch gesteckt Darauf achten, daß die beschriftete Seite der Bordscheibe zum Rollenlager zeigt. Axialspiel 0-0,1 mm	Le remontage est plus simple si vous montez d'abord l'arbre équipé dans la bride avant. Mettre le nombre de cales nécessaires à l'obtention d'un jeu de 0-0,1 mm Rondelle épaisse avec face gravée contre le roulement



Install pistons, joint with support and rollers and cylinder barrel on the shaft.	Die Kolben, die Synchronisationswelle einschl. Rollen, und die Kolbentrommel montieren.	Installer le barillet équipé des pistons, du cardan, des galets et poussoirs sur l'arbre

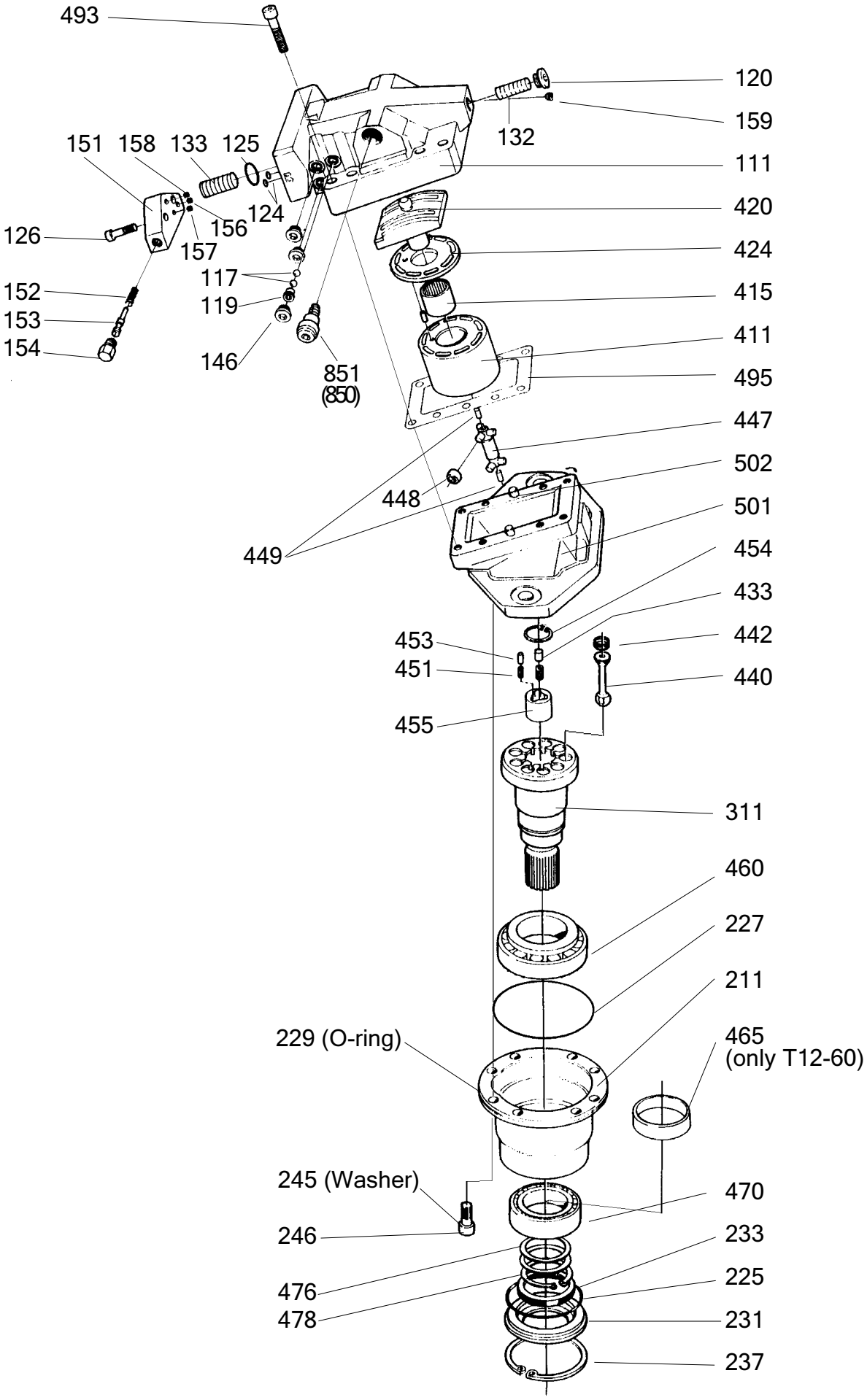


Note: To assure correct position of the support pin (499) in the cylinder barrel, first fit the support pin and secure it with some grease in the cylinder barrel before the barrel is positioned to the pistons and the joint shaft.	**Achtung**: Um das Herausfallen des Druckzapfens (Pos 499) bei der Montage zu vermeiden, sollte der Zapfen mit Fett in die Kolbentrommel eingesetzt werden.	**Nota**: Pour assurer un montage correct du poussoir (499) dans le barillet et le maintenir avec un peu de graisse avant de mettre le barillet sur les pistons et le cardan.



Install the bearing housing. In the cartridge version bearing housing there is a cut out for the pistons at max. angle setting. The bearing housing and the flange cannot be assembled wrongly as there is an irregularity in the pitch for the holding screws.	Montage des Lagergehäuses der Einschubversion. Im Lagergehäuse befindet sich eine Ausnehmung, um das Anlaufen der Kolben bei maximalem Schwenkwinkel zu vermeiden. Um eine Falschmontage auszuschließen ist die Lochteilung der Schraubenlöcher asymmetrisch ausgeführt.	Montage du carter. Dans la version cartouche, le carter possède un dégagement pour la passage des pistons à angle maxi. Le détrompage est assuré par les vis d'assemblage du carter et de la bride avant.

Item	Title	Bezeichnung	Désignation
111	END CAP	VERSTELLKOPF	CARTER ARRIERE
117	BALL	KUGEL	BILLE
119	VALVE SEAT	VENTILSITZ	SIEGE
120	HEXAGON PLUG	VERSCHLUßSCHRAUBE	BOUCHON 6 PANS EQUIPE
124	O-RING	O-RING	JOINT TORIQUE
125	O-RING	O-RING	JOINT TORIQUE
126	HEX SOCKET SCREW	ZYLINDERSCHRAUBE	VIS A 6 PANS CREUX
132	SETTING PISTON	STELLKOLBEN	PISTON DE COMMANDE
133	SETTING PISTON	STELLKOLBEN	PISTON DE COMMANDE
146	HEXAGON PLUG	VERSCHLUßSCHRAUBE	BOUCHON 6 PANS EQUIPE
152	COMPRESSION SPRING	FEDER	RESORT
153	VALVE SPOOL	VENTILSCHIEBER	TIROIR
154	COUPLING RIM	NIPPEL	RACCORD
156	NOZZLE	DROSSEL	GICLEUR
157	NOZZLE	DROSSEL	GICLEUR
158	NOZZLE	DROSSEL	GICLEUR
159	NOZZLE	DROSSEL	GICLEUR
211	BEARING HOUSING	MITTELGHÄUSE	CARTER
225	O-RING	O-RING	JOINT TORIQUE
227	O-RING	O-RING	JOINT TORIQUE
229	O-RING	O-RING	JOINT TORIQUE
231	SEAL CARRIER	DECKEL	PORTE JOINT
233	SHAFT SEAL	WELLENDICHTRING	JOINT D'ARBRE
237	RETAINING RING	SICHERUNGSRING	CIRCLIPS
245	SEAL WASHER	DICHTRING	BAGUE BS
246	HEX SOCKET SCREW	ZYLINDERSCHRAUBE	VIS A 6 PANS CREUX
311	SHAFT	WELLE	ARBRE
411	CYLINDER BARREL	KOLBENTROMMEL	BARILLET
413	GUIDE PIN	ARRETIERSTIFT	PION
415	NEEDLE BEARING	NADELLAGER	ROULEMENT A AIGUILLES
420	VALVE SEGMENT	STEUERSEGMENT	VALVE DE DISTRIBUTION
424	SLIDING PLATE	GLEITSCHEIBE	PLAQU D'USURE
433	COMPRESSION SPRING	FEDER	RESORT DE COMPRESSION
434	GUIDE PIN	FEDERFÜHRUNG	GUIDE
440	PISTON	KOLBEN	PISTON
442	PISTON RING	KOLBENRING	SEGMENT DE PISTON
447	JOINT SHAFT	SYNCHRONISATIONSWELLE	CARDAN
448	JOINT ROLLER	ROLLE	GALET
449	SUPPORT PIN	DRUCKZAPFEN	POISSOIR
451	SPRING PIN	SPANNSTIFT	GOUPILLE CREUSE
453	PIN	PAßSTIFT	GOUPILLE CYLINDRIQUE
454	RETAINING RING	SICHERUNGSRING	CIRCLIPS
455	JOINT COUPLING	KUPPLUNG	ENTRAINEUR
460	TAP ROL BEARING	KEGELROLLENLAGER	ROULEMENT CONIQUE
465	SPACER SLEEVE	DISTANZRING	ENTRETOISE
470	CYL BEARING	ROLLENLAGER	ROULEMENT DE BARILLET
476	SPACER WASHER	DISTANZSCHEIBE	ENTRETOISE
478	RETAINING RING	SICHERUNGSRING	CIRCLIPS
493	HEX SOCKET SCREW	SICHERUNGSRING	VIS A 6 PANS CREUX
495	GASKET	FLACHDICHDUNG	JOINT
501	FLANGE	BEFESTIGUNGSFLANSCH	BRIDE AVANT
502	PIN	PAßSTIFT	GOUPILLE CYLINDRIQUE
850	SAFETY VALVE	SICHERHETISVENTIL	VALVE DE SECURITE
851	SAFETY VALVE	SICHERHETISVENTIL	VALVE DE SECURITE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440
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311
460
227
211
229 (O-ring)
465
(only T12-60)
245 (Washer)
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246
233
476
225
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231
237

Test procedure	Funktionsprobe	Vérification du fonctionnement

Use a test stand that supplies a flow of about 30 l/min. and pressures of up to 300 bar.

A secondary flow of 3-5 l/min. at a pressure of 25 bar is required to supply low pressure for control.

Es wird ein Teststand benötigt, der einen Durchfluß von ungefähr 30 l/min und ein Druck von bis zu 300 bar liefern. Ein zweiter Kreis mit 3 - 5 l/min und einem Druck von 25 bar ist erforderlich, um die

Le banc d'essais doit avoir au moins un débit de 30 l/mn et la possibilité de monter en pression jusqu'à 300 bars.

Un second débit de 3 à 5 l/mn et à une pression de 25 bars est nécessaire pour le pilotage de régulateurs.

Test

1. Fill housing with hydraulic fluid and start the pump in the test stand.

2. Increase the pressure from the braking pump to brake the T12-motor until T12 inlet pressure reaches 200 bar.

3. Check the drain flow and compare with the table.

Test

1. Füllen Sie T12-Gehäuse und Leitungen mit Öl und starten Sie die Antriebspumpe.

2. Bremsen Sie über das Druckventil an der Bremspumpe, bis der Druck auf dem T12-Motor 200 erreicht hat.

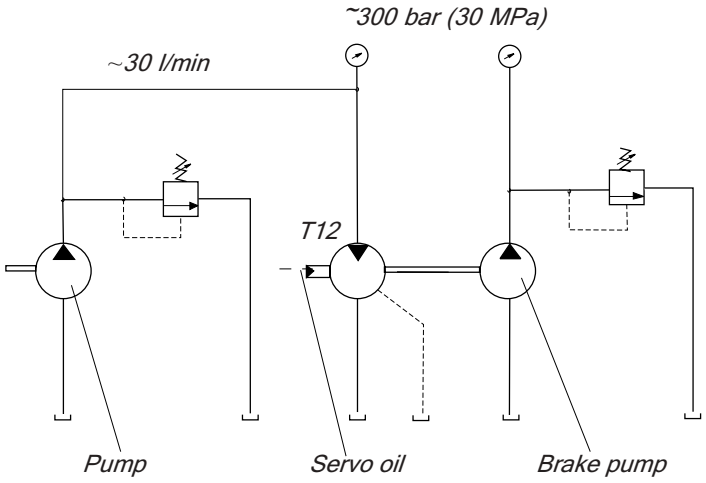
3. Kontrollieren Sie den Leckölstrom entsprechend der Tabelle.

Essais

1. Remplir d'huile le carter du moteur et les tuyauteries.

2. Créer un couple résistant en augmentant la pression de la pompe de freinage jusqu'à obtenir une pression de 200 bars sur le T12.

3. Contrôler le débit de drainage en tenant des valeurs de tableau.



Drain flow (l/min.).

Leckölstrom l/min.

Drainage (l/mn).

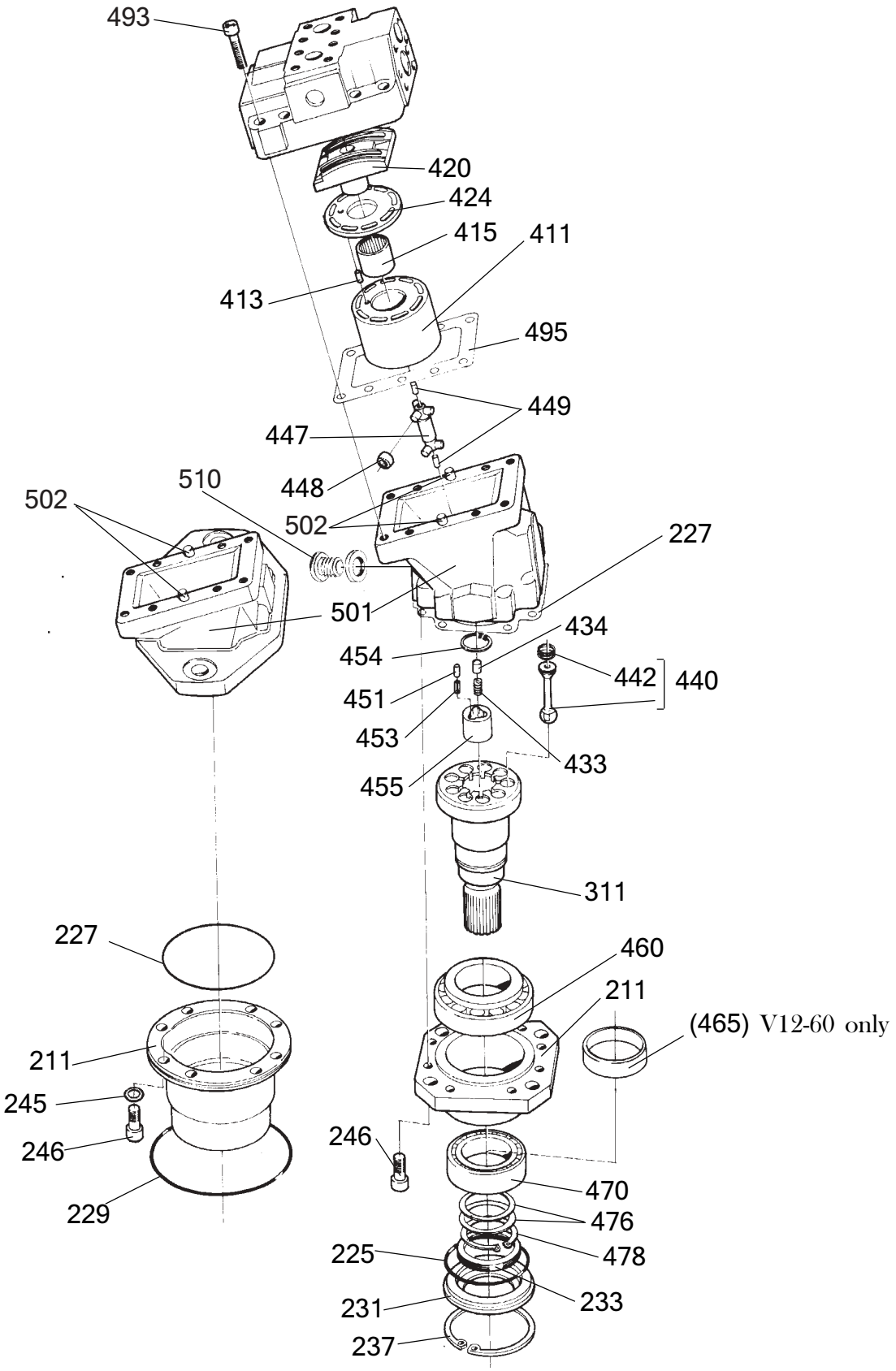
T12 - 60, -80
3.0 l/min.

Please contact our sales representative:

Parker Hannifin AB
VOAC Hydraulics Division
SE-461 82 Trollhättan
Sweden
Tel +46 520 986 00
Fax +46 520 371 05
www.parker.com

Catalog 9129 8212-19
Januari 1999, GB/DE/FR

Spare Parts Lists V12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(465) V12-60 only
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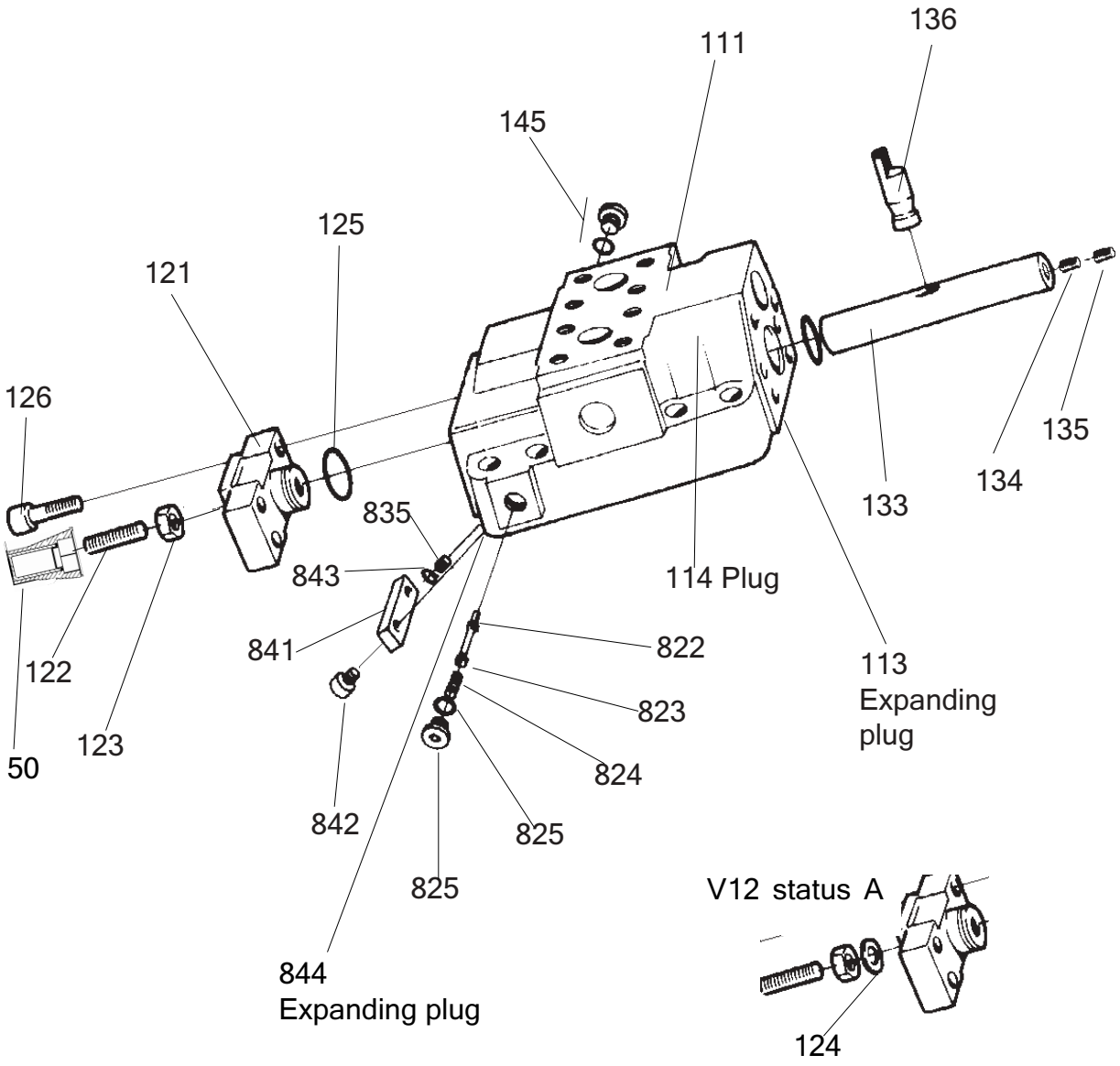
Item	Part No	Title	Benämning	Qty	Remarks
211	3792297	Bearing Housing	Lagerhus	1	Type C
211	3791851	Flange	Fläns	1	Type I
211	3709932	Flange	Fläns	1	Type S
225	925258	O-ring	O-ring	1	94,5*3, Nitrile
225	948981	O-ring	O-ring	1	94,5*3, Viton
227	3791854	Gasket	Packning	1	
227	3796540	O-ring	O-ring	1	114,5*3, Nitrile
227	3796541	O-ring	O-ring	1	114,5*3, Viton
229	3792913	O-ring	O-ring	1	150*4, For C-Housing
229	3794351	O-ring	O-ring	1	117,07*3,53, For S-Flange
231	3791510	Seal Carrier	Tätringshållare	1	
233	3795084	Shaft Seal	Tätningsring	1	45*65*6, Nitrile
233	3793419	Shaft Seal	Tätningsring	1	45*65*6, Viton
237	914548	Retaining Ring	Spårring	1	
245	947083	Seal Washer	Tätbricka	8	
246	3794766	Hex. Socket Screw	Insexskruv	8	M10*30, For C-Housing
246	949067	Hex. Socket Screw	Insexskruv	8	M10*30, For I-Flange
246	973198	Hex. Socket Screw	Insexskruv	8	M10*55, For S-Flange
311	3793747	Shaft	Axel	1	Type C
311	3793573	Shaft	Axel	1	Type D
311	3793059	Shaft	Axel	1	Type S
411	3791752	Cylinder Barrel	Cylindertrumma	1	
413	3793447	Guide Pin	Styrstift	3	
415	184777	Needle Bearing	Nålbussning	1	
420	3793196	Valve Segment assy.	Ventilsegment kpl.	1	
424	3793065	Sliding Plate	Glidplatta	1	
433	3792348	Compression Spring	Tryckfjäder	1	
434	3791500	Guide Pin	Styrpinne	1	
440	3793583	Piston assy.	Kolv kpl.	9	
442	3792345	Piston Ring	Lamellring	27	
447	3782238	Joint Shaft	Synkroniseringsaxel	1	Replaces 3791518
448	3707534	Joint Roller	Rulle	6	
449	3791502	Support Pin	Stödpinne	2	
451	949802	Spring Pin	Rörpinne	3	
453	3705958	Pin	Pinne	3	
454	3792411	Retaining Ring	Spårring	1	
455	3791513	Joint Coupling	Medbringare	1	
460	184687	Tapered Roller Bearing	Koniskt rullager	1	T7FC 050
465	3791763	Spacer Sleeve	Distanshylsa	1	
470	184760	Cylindrical Bearing	Cylindriskt lager	1	NUP2210ECP
476	974190	Spacer Washer	Distansbricka		0,5
476	977614	Spacer Washer	Distansbricka		0,6
476	977615	Spacer Washer	Distansbricka		0,8
476	974191	Spacer Washer	Distansbricka		1,0
478	914472	Retaining Ring	Spårring	1	
493	973198	Hex Socket Screw	Insexskruv	8	M10*55, 10.9
495	3791772	Gasket	Packning	1	
501	3793445	Intermediate Housing	Mellanhus	1	Type C
501	3793066	Intermediate Housing	Mellanhus	1	Type I
501	3793755	Intermediate Housing	Mellanhus	1	Type S
502	950588	Pin	Pinne	2	
510	3793606	Hex Socket Plug assy	Insexpropp kpl	1	M18, Nitrile, For C-Housing
510	3793607	Hex Socket Plug assy	Insexpropp kpl	1	M18, Viton, For C-Housing
510	3793600	Hex Socket Plug assy	Insexpropp kpl	1	M22, For I-Housing
510	3708150	Hex Socket Plug assy	Insexpropp kpl	1	7/8"-14, For S-Housing

Item	Part No	Title	Benämning	Qty	Remarks
211	3792279	Bearing Housing	Lagerhus	1	Type C
211	3791851	Flange	Fläns	1	Type I
211	3709932	Flange	Fläns	1	Type S
225	925258	O-ring	O-ring	1	94,5*3, Nitrile
225	948981	O-ring	O-ring	1	94,5*3, Viton
227	3791854	Gasket	Packning	1	
227	925266	O-ring	O-ring	1	139.5*3, Nitrile
227	949736	O-ring	O-ring	1	139.5*3, Viton
229	3792875	O-ring	O-ring	1	180*4, For C-Housing
229	3794351	O-ring	O-ring	1	117,07*3,53, For S-Flange
231	3791510	Seal Carrier	Tätringshållare	1	
233	3795084	Shaft Seal	Tätningsring	1	45*65*6, Nitrile
233	3793419	Shaft Seal	Tätningsring	1	45*65*6, Viton
237	914548	Retaining Ring	Spårring	1	
245	947083	Seal Washer	Tätbricka	8	
246	949067	Hex. Socket Screw	Insexskruv	8	M10*30
246	973198	Hex. Socket Screw	Insexskruv	8	M10*55, For S-Flange
311	3794779	Shaft	Axel	1	Type C
311	3793303	Shaft	Axel	1	Type D
311	3792893	Shaft	Axel	1	Type S
411	3709968	Cylinder Barrel	Cylindertrumma	1	
413	3793447	Guide Pin	Styrstift	3	
415	184093	Needle Bearing	Nålbussning	1	
420	3792937	Valve Segment assy.	Ventilsegment kpl.	1	
424	3792896	Sliding Plate	Glidplatta	1	
433	3792348	Compression Spring	Tryckfjäder	1	
434	3791500	Guide Pin	Styrpinne	1	
440	3793306	Piston assy.	Kolv kpl.	9	
442	3791607	Piston Ring	Lamellring	27	
447	3782238	Joint Shaft	Synkroniseringsaxel	1	Replaces 3791518
448	3707534	Joint Roller	Rulle	6	
449	3791502	Support Pin	Stödpinne	2	
451	949802	Spring Pin	Rörpinne	3	
453	3705958	Pin	Pinne	3	
454	3792411	Retaining Ring	Spårring	1	
455	3791513	Joint Coupling	Medbringare	1	
460	184660	Tapered Roller Bearing	Koniskt rullager	1	T7FC 055
470	184760	Cylindrical Bearing	Cylindriskt lager	1	NUP2210ECP
476	974190	Spacer Washer	Distansbricka		0,5
476	977614	Spacer Washer	Distansbricka		0,6
476	977615	Spacer Washer	Distansbricka		0,8
476	974191	Spacer Washer	Distansbricka		1,0
478	914472	Retaining Ring	Spårring	1	
493	974111	Hex Socket Screw	Insexskruv	8	M10*60, 10.9
495	3709997	Gasket	Packning	1	
501	3792910	Intermediate Housing	Mellanhus	1	Type C
501	3792894	Intermediate Housing	Mellanhus	1	Type I
501	3793757	Intermediate Housing	Mellanhus	1	Type S
502	950588	Pin	Pinne	2	
510	3793606	Hex Socket Plug assy	Insexpropp kpl	1	M18, Nitrile, For C-Housing
510	3793607	Hex Socket Plug assy	Insexpropp kpl	1	M18, Viton, For C-Housing
510	3793600	Hex Socket Plug assy	Insexpropp kpl	1	M22, For I-Housing
510	3708150	Hex Socket Plug assy	Insexpropp kpl	1	7/8"-14, For S-Housing

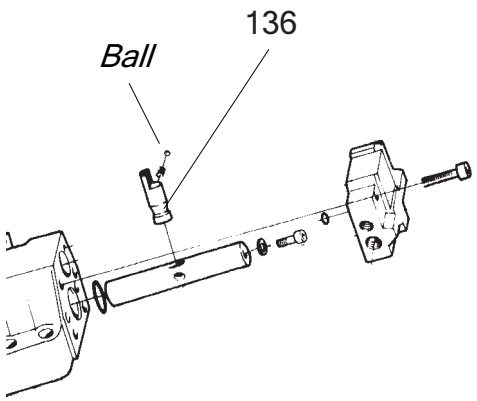
Item	Part No	Title	Benämning	Qty	Remarks
211	3794018	Bearing Housing	Lagerhus	1	Type C
211	3791878	Flange	Fläns	1	Type I
211	3793433	Flange	Fläns	1	Type S
225	3796540	O-ring	O-ring	1	114,5*3, Nitrile
227	3791882	Gasket	Packning	1	
227	925266	O-ring	O-ring	1	139,5*3, Nitrile
229	3792914	O-ring	O-ring	1	192*4, Nitrile
231	3791954	Seal Carrier	Tätringshållare	1	
233	3795085	Shaft Seal	Tätningsring	1	55*72*6, Nitrile
237	914552	Retaining Ring	Spårring	1	
245	947083	Seal Washer	Tätbricka	8	
246	969279	Hex. Socket Screw	Insexskruv	8	M12*35
246	3797016	Hex. Socket Screw	Insexskruv	8	M10*35, for C-Housing
311	3794840	Shaft	Axel	1	Type C
311	3792452	Shaft	Axel	1	Type D
311	3795142	Shaft	Axel	1	Type E
311	3793429	Shaft	Axel	1	Type S
411	3709594	Cylinder Barrel	Cylindertrumma	1	
413	3793185	Guide Pin	Styrstift	3	
415	184778	Needle Bearing	Nålbussning	1	
420	3793188	Valve Segment assy.	Ventilsegment kpl.	1	
424	3793183	Sliding Plate	Glidplatta	1	
433	3709175	Compression Spring	Tryckfjäder	1	
434	3709886	Guide Pin	Styrpinne	1	
440	3782326	Piston assy.	Kolv kpl.	9	Replaces 3792373
442	3709933	Piston Ring	Lamellring	27	
447	3781043	Joint Shaft	Synkroniseringsaxel	1	Replaces 3709856
448	3706393	Joint Roller	Rulle	6	
449	3709889	Support Pin	Stödpinne	2	
451	949802	Spring Pin	Rörpinne	3	
453	3705958	Pin	Pinne	3	
454	3792387	Retaining Ring	Spårring	1	
455	3709887	Joint Coupling	Medbringare	1	
460	184662	Tapered Roller Bearing	Koniskt rullager	1	T7FC 065
470	184762	Cylindrical Bearing	Cylindriskt lager	1	NUP2212ECP
476	946297	Spacer Washer	Distansbricka		0,5
476	977618	Spacer Washer	Distansbricka		0,6
476	977619	Spacer Washer	Distansbricka		0,8
477	946298	Spacer Washer	Distansbricka		1,0
478	914476	Retaining Ring	Spårring	1	
493	974122	Hex Socket Screw	Insexskruv	8	M12*65
495	3709817	Gasket	Packning	1	
501	3794016	Intermediate Housing	Mellanhus	1	Type C
501	3793179	Bearing Housing	Lagerhus	1	Type I
501	3793783	Bearing Housing	Lagerhus	1	Type S
502	950588	Pin	Pinne	2	
510	3794088	Hex Socket Plug assy	Insexpropp kpl	1	M27, Nitrile
510	3793606	Hex Socket Plug assy	Insexpropp kpl	1	M18, Nitrile, for C-Housing
510	3707299	Hex Socket Plug assy	Insexpropp kpl	1	1 1/16"-12, for S-Housing

Item	Part No	Title	Benämning	Qty	Remarks
211	3793588	Flange	Fläns	1	TYPE SAE D
211	3794959	Flange	Fläns		TYPE N
211	3791827	Flange	Fläns		TYPE I
225	3796540	O-ring	O-ring	1	114.5*3 N 70
225	3796541	O-ring	O-ring		114,5*3 V 70
227	3792151	Gasket	Packning	1	
231	3791954	Seal carrier	Tätringshållare	1	
233	3795085	Shaft seal	Tätningsring	1	55*72*6N
233	3793420	Shaft seal	Tätningsring		55*72*6V
237	914552	Retaining ring	Spårring	1	
246	969224	Hex s scr	Ins skruv	8	M12*70 10.9
311	3792263	Shaft	Axel	1	TYPE S
311	3792249	Shaft	Axel		TYPE D
311	3795576	Shaft	Axel		TYPE C
311	3791842	Shaft	Axel		TYPE K
411	3709755	Cylinder barrel	Cylindertrumma	1	
413	3793185	Guide pin	Styrstift	3	
415	184768	Needle bearing	Nålbussning	1	
420	3794064	Valve segment assy	Ventilsegment kpl	1	
424	3793440	Sliding plate	Glidplatta	1	
433	3709175	Compression spring	Tryckfjäder	1	
434	3709761	Guide pin	Styrpinne	1	
440	3782400	Piston	Kolv	9	Replaces 3792094
442	3709934	Piston ring	Lamellring diam	27	
447	3782233	Joint shaft	Synkroniseringsaxel	1	Replaces 3792461
448	3706669	Joint roller	Rulle	6	
449	3708046	Support pin	Stödpinne	2	
451	3798103	Spring pin	Rörpinne	3	Or 973526
453	3792087	Pin	Pinne	3	
454	914525	Retaining ring	Spårring	1	
455	3709754	Joint coupling	Medbringare	1	
460	184775	Tap rol bearing	Kon rullager	1	T7FC 075
470	184762	Cyl bearing	Cyl lager	1	NUP2212ECP
476	946297	Spacer washer 0.5	Distansbricka 0,5	1	
476	977618	Spacer washer 0.6	Distansbricka 0,6	1	
476	977619	Spacer washer 0.8	Distansbricka 0,8	1	
477	946298	Spacer washer 1.0	Distansbricka 1,0	1	
478	914476	Retaining ring	Spårring	1	
493	969224	Hex s scr	Ins skruv	8	M12*70 10.9
495	3791820	Gasket	Packning	1	
501	3793594	Bearing housing	Lagerhus	1	SAE
501	3793781	Bearing housing	Lagerhus		ISO
502	950588	Pin	Pinne	2	
510	3707299	Hex. Plug	Insexpropp	1	S-Hsng,1-1/16
510	3794088	Hex. Plug	Insexpropp	1	M27

V12 status D *as shown in the picture.*
V12 status C *has (122) Hexagon S Screw, (124) Seal Washer but no Nut item (123).*
V12 status A *has (122) Set Screw, (123) Nut and (124) Seal Washer.*



V12 status B, *companion pin, item 136 is locatet by a detent ball and a spring and displacement limiters are installed in the ends of the Setting Piston.*
Spares for this status are no longer available and has to be rebuilt to status D.

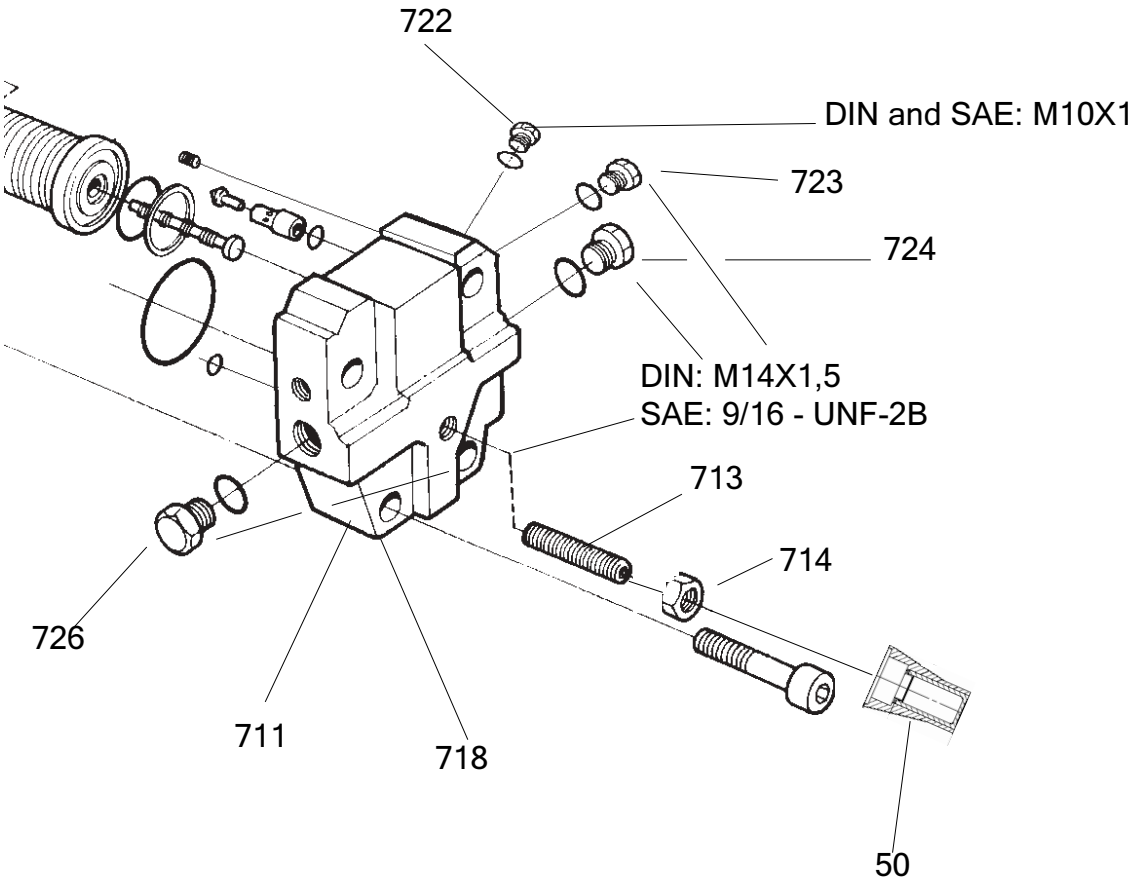


Item	Part No	Benämning	Title	Qty	Remarks
50	3797065	Plomberingshylsa	Seal Cap M10	1	Red
111	3793070	Ansl.Block iso axi	End Cap Iso Axial	1	Type A
111	3793596	Ansl.Block Iso Rad	End Cap Iso Rad	1	Type F
111	3794718	Ansl.Block Sae Rad	End Cap Sae Rad	1	Type S
111	3794721	Ansl.Bl.Sae Rad Spolv	End Cap Sae Rad Flush	1	Type S, L01
111	3793754	Ansl.Block Sae Axi	End Cap Sae Axial	1	Type U
111	3794720	Ansl.Bl.Sae Axi Spolv	End Cap Sae Axi Flush	1	Type U, L01
113	3701127	Expanderplugg 6	Expanding Plug 6	1	
114	962932	Stoppskruv M8*8	Set Screw M8*8	1	
116	3701127	Expanderplugg 6	Expanding Plug 6	1	
121	3799779	Lock	Cover	1	Only for 3799011
122	975614	Stoppskruv M10*60	Set Screw M10*60	1	
123	3799011	Tätmutter	Seal Nut M10	1	Only status D
124	3792367	Gängtätbricka	Seal Washer	1	Status A/C
125	960170	O-Ring 22,2*3 N 90	O-Ring 22.2*3 N 90	1	
126	949067	Ins Skruv M10*30 10.9	Hex S Scr M10*30 10.9	4	
133	3793146	Ställkolv	Setting Piston	1	
134	963023	Stoppskruv M10*12	Set Screw M10*12	1	
135	962943	Stoppskruv M10*12	Set Screw M10*12	1	
136	3791767	Medbringartapp	Companion Pin	1	
145	3793600	Insexpropp Kpl M22 H	Hex Sock. Pl.Assy M22	2	
822	3792216	Spolkolv	Shuttle	1	
823	3792834	Bricka 7,4*11,5*2	Washer 7.4*11.5*2	2	
824	3709866	Tryckfjäder	Compression Spring	2	
825	3793353	Sexkantpropp Kpl M14	Hexagon Plug Assy N	2	
835	3793326	Munstycke 0,8 (M10*1)	Nozzle	1	0,8
835	3794410	Munstycke 1,0 (M10*1)	Nozzle	1	1,0
835	3794411	Munstycke 1,1 (M10*1)	Nozzle	1	1,1
835	3794412	Munstycke 1,2 (M10*1)	Nozzle	1	1,2
835	3794413	Munstycke 1,3 (M10*1)	Nozzle	1	1,3
835	3794414	Munstycke 1,4 (M10*1)	Nozzle	1	1,4
835	3794415	Munstycke 1,5 (M10*1)	Nozzle	1	1,5
835	3794416	Munstycke 1,6 (M10*1)	Nozzle	1	1,6
835	3794417	Munstycke 1,7 (M10*1)	Nozzle	1	1,7
835	3794418	Munstycke 1,8 (M10*1)	Nozzle	1	1,8
835	3794419	Munstycke 1,9 (M10*1)	Nozzle	1	1,9
835	3794420	Munstycke 2,0 (M10*1)	Nozzle	1	2,0
841	3793328	Skyddslock	Protective Cover	1	
842	974076	Ins Skruv M6*20 10.9	Hex S Scr M6*20 10.9	2	
843	925055	O-Ring 11,3*2,4 N 70	O-Ring 11.3*2.4 N 70	1	
844	3795269	Expanderplugg 9	Expanding Plug 9	2	

Item	Part No	Title	Benämning	Qty	Remarks
50	3797065	Seal Cap M10	Plomberingshylsa	1	Red
111	3793531	End Cap Iso Axial	Ansl.Block Iso Axi	1	Type A
111	3793008	End Cap Iso Rad	Ansl.Block Iso Rad	1	Type F
111	3794715	End Cap Iso Rad Flush	Ansl.Bl.Iso Rad Spolv	1	Type F, L01
111	3793685	End Cap Sae Radial	Ansl.Block Sae Rad	1	Type S
111	3794347	End Cap Sae Rad Flush	Ansl.Bl.Sae Rad Spolv	1	Type S, L01
111	3793756	End Cap Sae Axial	Ansl.Block Sae Axi	1	Type U
111	3794716	End Cap Sae Axi Flush	Ansl.Bl.Sae Axi Spolv	1	Type U, L01
113	3701127	Expanding Plug 6	Expanderplugg 6	1	
114	962932	Set Screw M8*8	Stoppskruv M8*8	1	
116	3701127	Expanding Plug 6	Expanderplugg 6	1	
121	3799779	Cover	Lock	1	Only for 3799011
122	975614	Set Screw M10*60	Stoppskruv M10*60	1	
123	3799011	Seal Nut M10	Tätmutter	1	Only status D
124	3792367	Seal Washer M10	Gängtätbricka M10	1	Status A/C
125	960170	O-Ring 22.2*3 N 90	O-Ring 22,2*3 N 90	1	
126	949067	Hex S Scr M10*30 10.9	Ins Skruv M10*30 10.9	4	
133	3792909	Setting Piston	Ställkolv	1	
134	963023	Set Screw M10*12	Stoppskruv M10*12	1	
135	962943	Set Screw M10*12	Stoppskruv M10*12	1	
136	3709995	Companion Pin	Medbringartapp	1	
145	3793600	Hex Sock. Pl.Assy M22	Insexpropp Kpl M22 H	2	For F
822	3792216	Shuttle	Spolkolv	1	
823	3792834	Washer 7.4*11.5*2	Bricka 7,4*11,5*2	2	
824	3709866	Compression Spring	Tryckfjäder	2	
825	3793353	Hexagon Plug Assy N	Sexkantpropp Kpl M14	2	
835	3794410	Nozzle	Munstycke 1,0 (M10*1)	1	1,0
835	3794411	Nozzle	Munstycke 1,1 (M10*1)	1	1,1
835	3794412	Nozzle	Munstycke 1,2 (M10*1)	1	1,2
835	3794413	Nozzle	Munstycke 1,3 (M10*1)	1	1,3
835	3794414	Nozzle	Munstycke 1,4 (M10*1)	1	1,4
835	3794415	Nozzle	Munstycke 1,5 (M10*1)	1	1,5
835	3794416	Nozzle	Munstycke 1,6 (M10*1)	1	1,6
835	3794417	Nozzle	Munstycke 1,7 (M10*1)	1	1,7
835	3794418	Nozzle	Munstycke 1,8 (M10*1)	1	1,8
835	3794419	Nozzle	Munstycke 1,9 (M10*1)	1	1,9
835	3794420	Nozzle	Munstycke 2,0 (M10*1)	1	2,0
841	3793328	Protective Cover	Skyddslock	1	
842	974076	Hex S Scr M6*20 10.9	Ins Skruv M6*20 10.9	2	
843	925055	O-Ring 11.3*2.4 N 70	O-Ring 11,3*2,4 N 70	1	
844	3795269	Expanding Plug 9	Expanderplugg 9	2	

Item	Part No	Title	Benämning	Qty	Remarks
50	3797065	Seal Cap M10	Plomberingshylsa	1	Red
111	3793612	End Cap Iso Axial	Ansl.Block Iso Axi	1	Type A
111	3793258	End Cap Iso Axi Flush	Ansl.Bl.Iso Axi Spolv	1	Type A,L01
111	3794047	End Cap Iso Radial	Ansl.Block Iso Rad	1	Type F
111	3794327	End Cap Iso Rad Flush	Ansl.Bl.Iso Rad Spolv	1	Type F, L01
111	3794330	End Cap Sae Radial	Ansl.Block Sae Rad	1	Type S
111	3794328	End Cap Sae Rad Flush	Ansl.Bl.Sae Rad Spolv	1	Type S, L01
111	3793784	End Cap Sae Axial	Ansl.Block Sae Axi	1	Type U
111	3794329	End Cap Sae Axi Flush	Ansl.Bl.Sae Axi Spolv	1	Type U, L01
113	3795603	Seal Plug M6	Förseglingspropp M6	1	
114	962932	Set Screw M8*8	Stoppskruv M8*8	1	
116	3795603	Seal Plug M6	Förseglingspropp M6	1	
121	3799778	Cover	Lock	1	Only for 3799011
122	975614	Set Screw M10*60	Stoppskruv M10*60	1	
123	3799011	Seal Nut M10	Tätmutter M10	1	Only status D
124	3792367	Seal Washer M10	Gängtätbricka M10	1	Status A/C
125	960171	O-Ring 24.2*3 N 90	O-Ring 24,2*3 N 90	1	
126	949067	Hex S Scr M10*30 10.9	Ins Skruv M10*30 10.9	4	
133	3793178	Setting Piston	Ställkolv	1	
134	963023	Set Screw M10*12	Stoppskruv M10*12	1	
135	962943	Set Screw M10*12	Stoppskruv M10*12	1	
136	3709797	Companion Pin	Medbringartapp	1	
145	3793600	Hex Sock. Pl.Assy M22	Insexpropp Kpl M22 H		
822	3792216	Shuttle	Spolkolv	1	
823	3792834	Washer 7.4*11.5*2	Bricka 7,4*11,5*2	2	
824	3709866	Compression Spring	Tryckfjäder	2	
825	3793353	Hexagon Plug Assy N	Sexkantpropp Kpl M14	2	
835	3794410	Nozzle	Munstycke 1,0 (M10*1)	1	1,0
835	3794411	Nozzle	Munstycke 1,1 (M10*1)	1	1,1
835	3794412	Nozzle	Munstycke 1,2 (M10*1)	1	1,2
835	3794413	Nozzle	Munstycke 1,3 (M10*1)	1	1,3
835	3794414	Nozzle	Munstycke 1,4 (M10*1)	1	1,4
835	3794415	Nozzle	Munstycke 1,5 (M10*1)	1	1,5
835	3794416	Nozzle	Munstycke 1,6 (M10*1)	1	1,6
835	3794417	Nozzle	Munstycke 1,7 (M10*1)	1	1,7
835	3794418	Nozzle	Munstycke 1,8 (M10*1)	1	1,8
835	3794419	Nozzle	Munstycke 1,9 (M10*1)	1	1,9
835	3794420	Nozzle	Munstycke 2,0 (M10*1)	1	2,0
841	3793328	Protective Cover	Skyddslock	1	
842	974076	Hex S Scr M6*20 10.9	Ins Skruv M6*20 10.9	2	
843	925055	O-Ring 11.3*2.4 N 70	O-Ring 11,3*2,4 N 70	1	
844	3795269	Expanding Plug 9	Expanderplugg 9	2	

Item	Part No	Title	Benämning	Qty	Remarks
50	3797065	Seal Cap M10	Plomberingshylsa	1	Red
111	3793780	End Cap Iso Axial	Ansl.Block Iso Axi	1	Type A
111	3794336	End Cap Iso Axi Flush	Ansl.Bl.Iso Axi Spolv	1	Type A,L01
111	3794325	End Cap Iso Radial	Ansl.Block Iso Rad	1	Type F
111	3794339	End Cap Iso Rad Flush	Ansl.Bl.Iso Rad Spolv	1	Type F, L01
111	3794326	End Cap Sae Radial	Ansl.Block Sae Rad	1	Type S
111	3794338	End Cap Sae Rad Flush	Ansl.Bl.Sae Rad Spolv	1	Type S, L01
111	3793585	End Cap Sae Axial	Ansl.Block Sae Axi	1	Type U
111	3794337	End Cap Sae Axi Flush	Ansl.Bl.Sae Axi Spolv	1	Type U, L01
113	3795603	Seal Plug M6	Förseglingspropp M6	1	
114	963013	Set Screw M8*10	Stoppskruv M8*10	1	
116	3795603	Seal Plug M6	Förseglingspropp M6	1	
121	3799780	Cover	Lock	1	Only for 3799011
122	975614	Set Screw M10*60	Stoppskruv M10*60	1	
123	3799011	Seal Nut M10	Tätmutter	1	Only status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	960173	O-Ring 29.2*3 N 90	O-Ring 29,2*3 N 90	1	
126	969279	Hex S Scr M12*35 10.9	Ins Skruv M12*35 10.9	4	
133	3793587	Setting Piston	Ställkolv	1	
134	963023	Set Screw M10*12	Stoppskruv M10*12	1	
135	962943	Set Screw M10*12	Stoppskruv M10*12	1	
136	3709527	Companion Pin	Medbringartapp	1	
145	3793600	Hex Sock. Pl.Assy M22	Insexpropp Kpl M22 H	2	
822	3792216	Shuttle	Spolkolv	1	
823	3792834	Washer 7.4*11.5*2	Bricka 7,4*11,5*2	2	
824	3709866	Compression Spring	Tryckfjäder	2	
825	3793353	Hexagon Plug Assy N	Sexkantpropp Kpl M14	2	
835	3794410	Nozzle	Munstycke 1,0 (M10*1)	1	1,0
835	3794411	Nozzle	Munstycke 1,1 (M10*1)	1	1,1
835	3794412	Nozzle	Munstycke 1,2 (M10*1)	1	1,2
835	3794413	Nozzle	Munstycke 1,3 (M10*1)	1	1,3
835	3794414	Nozzle	Munstycke 1,4 (M10*1)	1	1,4
835	3794415	Nozzle	Munstycke 1,5 (M10*1)	1	1,5
835	3794416	Nozzle	Munstycke 1,6 (M10*1)	1	1,6
835	3794417	Nozzle	Munstycke 1,7 (M10*1)	1	1,7
835	3794418	Nozzle	Munstycke 1,8 (M10*1)	1	1,8
835	3794419	Nozzle	Munstycke 1,9 (M10*1)	1	1,9
835	3794420	Nozzle	Munstycke 2,0 (M10*1)	1	2,0
841	3793328	Protective Cover	Skyddslock	1	
842	974076	Hex S Scr M6*20 10.9	Ins Skruv M6*20 10.9	2	
843	925055	O-Ring 11.3*2.4 N 70	O-Ring 11,3*2,4 N 70	1	
844	3795269	Expanding Plug 9	Expanderplugg 9	2	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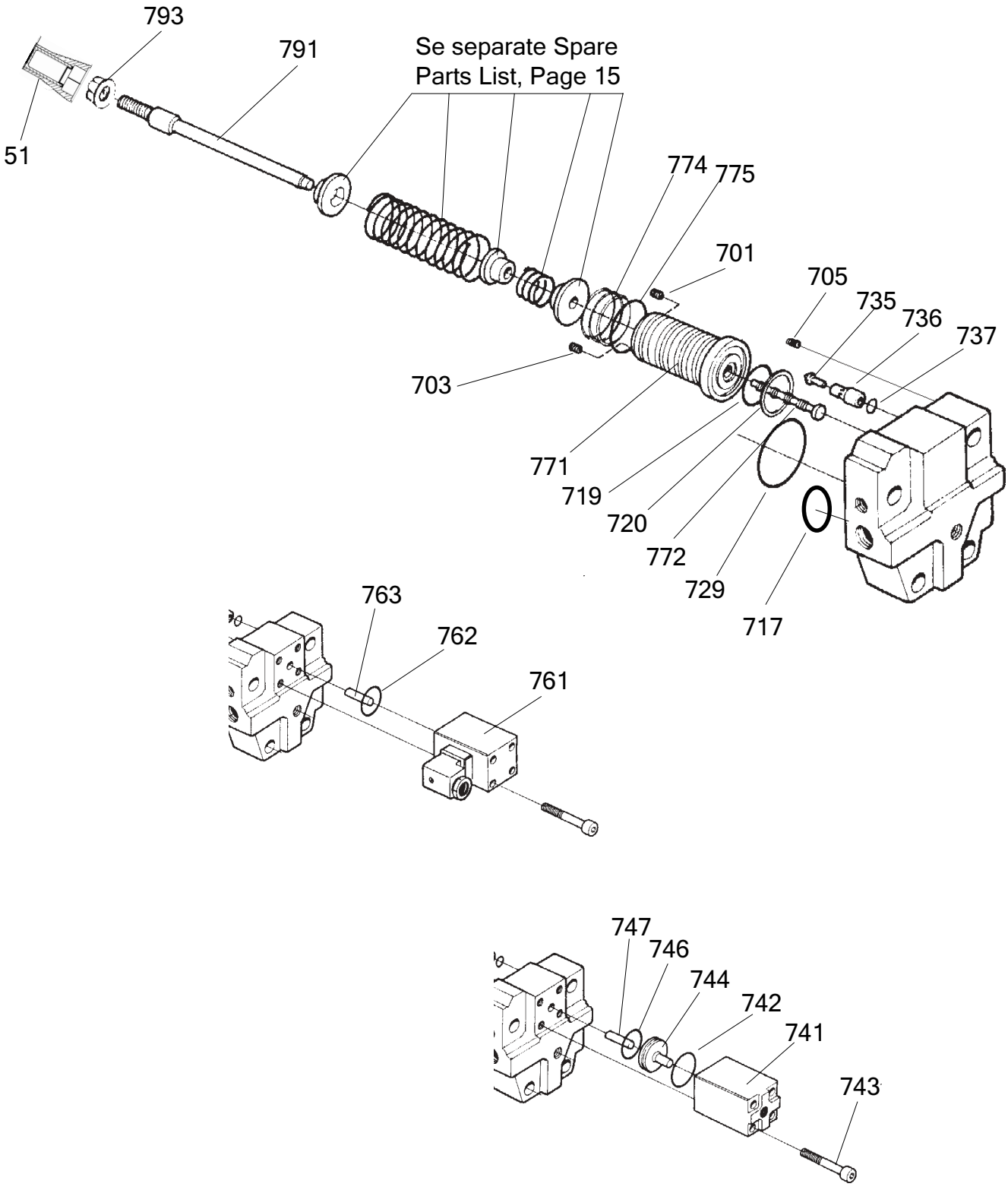
Item	Part No	Title	Frame size	Qty	Remarks
50	3797065	Seal Cap M10		1	Red
711	3799781	ISO (ACE--I HOS---)	60	1	Replaces 3793198
711	3799785	ISO (ACI--I)	60	1	Replaces 3794489
711	3799787	ISO (AHE--I)	60	1	Replaces 3794897
711	3799789	ISO (AHI--I)	60	1	Replaces 3795039
711	3799783	ISO (EOL--- EPL---)	60	1	Replaces 3794483
711	3799782	SAE (ACE--I HOS---	60	1	Replaces 3794137
711	3799786	SAE (ACI--I)	60	1	Replaces 3794490
711	3799788	SAE (AHE--I)	60	1	Replaces 3795040
711	3799790	SAE (AHI--I)	60	1	Replaces 3794915
711	3799784	SAE (EOL--- EPL---)	60	1	Replaces 3794484
711	3799797	ISO (ACE--I HOS---	80	1	Replaces 3793518
711	3799791	ISO (ACI--I)	80	1	Replaces 3793727
711	3799799	ISO (AHE--I)	80	1	Replaces 3793731
711	3799795	ISO (AHI--I)	80	1	Replaces 3793730
711	3799793	ISO (EOL--- EPL---)	80	1	Replaces 3793728
711	3799798	SAE (ACE--I HOS---	80	1	Replaces 3794072
711	3799792	SAE (ACI--I)	80	1	Replaces 3793001
711	3799800	SAE (AHE--I)	80	1	Replaces 3793736
711	3799796	SAE (AHI--I)	80	1	Replaces 3793141
711	3799794	SAE (EOL--- EPL---)	80	1	Replaces 3793012
711	3799803	ISO (ACE--I HOS---	110	1	Replaces 3793139
711	3799801	ISO (ACI--I)	110	1	Replaces 3794275
711	3795568	ISO (AEI	110	1	Brake def.
711	3799809	ISO (AHE--I)	110	1	Replaces 3794651
711	3799807	ISO (AHI--I)	110	1	Replaces 3794650
711	3799805	ISO (EOL--- EPL---)	110	1	Replaces 3794202
711	3799804	SAE (ACE--I HOS---	110	1	Replaces 3793671
711	3799802	SAE (ACI--I)	110	1	Replaces 3794274
711	3799810	SAE (AHE--I)	110	1	Replaces 3794653
711	3799808	SAE (AHI--I)	110	1	Replaces 3794652
711	3799806	SAE (EOL--- EPL---)	110	1	Replaces 3794201
711	3799813	ISO (ACE--I HOS---	160	1	Replaces 3796223
711	3799811	ISO (ACI--I)	160	1	Replaces 3796224
711	3799819	ISO (AHE--I)	160	1	Replaces 3796225
711	3799817	ISO (AHI--I)	160	1	Replaces 3796216
711	3799815	ISO (E-----)	160	1	Replaces 3796217
711	3799814	SAE (ACE--I HOS---	160	1	Replaces 3796165
711	3799812	SAE (ACI--I)	160	1	Replaces 3796215
711	3799820	SAE (AHE--I)	160	1	Replaces 3796226
711	3799818	SAE (AHI--I)	160	1	Replaces 3796227
711	3799816	SAE (E-----)	160	1	Replaces 3796228
713	975616	Set Screw M10x80		1	
713	975615	Set Screw M10x70	60,80	1	For seal cap
713	975614	Set Screw M10x60	110,160	1	For seal cap
714	3799011	Seal Nut M10		1	Only status D
715	3792367	Seal Washer		1	Status A/C
718	3701127	Expanding Plug 6		1	
722	3795603	Seal Plug M6		1	Alt.
722	3793398	Plug Ass. M10		1	Alt.
723	3707297	Hexag. Plug Assy 9/16		1	
724	3707297	Hexag. Plug Assy 9/16		1	
724	3791725	Plug Ass. M14x1.5		1	
726	3707297	Hexag. Plug Assy 9/16		1	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744
742
741
743

Item	Part No	Title	Benämning	Qty	
51	3797064	Seal Cap M8	Plomberingshylsa	1	Red
701		Nozzle	Munstycke		As required
703		Nozzle	Munstycke		As required
705		Nozzle	Munstycke		As required
	3704587	Nozzle 0.5	Munstycke 0,5		
	3704588	Nozzle 0.6	Munstycke 0,6		
	3704589	Nozzle 0.7	Munstycke 0,7		
	3704590	Nozzle 0.8	Munstycke 0,8		
	3704591	Nozzle 0.9	Munstycke 0,9		
	3704592	Nozzle 1.0	Munstycke 1,0		
	3704593	Nozzle 1.1	Munstycke 1,1		
	3704594	Nozzle 1.2	Munstycke 1,2		
	3704595	Nozzle 1.3	Munstycke 1,3		
	3704596	Nozzle 1.4	Munstycke 1,4		
	3704597	Nozzle 1.5	Munstycke 1,5		
717	960159	O-Ring 8,3*2,4 N90	O-Ring 8,3*2,4 N90	3	
729	3792467	O-Ring N90	O-Ring N90	1	V12-060
729	3792510	O-Ring N90	O-Ring N90	1	V12-080
729	3792379	O-Ring 31,42*2,62 N90	O-Ring 31,42*2,62 N90	1	V12-110
729	3792319	O-Ring N90	O-Ring N90	1	V12-160
735	3792432	Valve Cone	Ventilkägla	2	
736	3782813	Valve Guide	Ventilstyrning	2	Repl. 3792433
737	967747	O-Ring 9,4*2,1 N90	O-Ring 9,4*2,1 N90	4	Repl. 960159
737	3782816	O-Ring 9,5*2,0 V80	O-Ring 9,5*2,0 V80	4	
737	3782817	Support Ring	Stödring	4	Together with 3782813
761	3793577	Solenoid 12v	Proportionalmagn. 12v	1	
761	3793578	Solenoid 24v	Proportionalmagn. 24v	1	
762	942382	O-Ring 18,77*1,78 N70	O-Ring 18,77*1,78 N70	1	
763	3794013	Guiding Pin	Styrpinne	1	
791	3709998	Adjusting Screw	Ställskruv 60-110	1	
793	3704966	Seal Nut M8*1	Tätmutter M8*1	1	

Valve Sleeve Kit

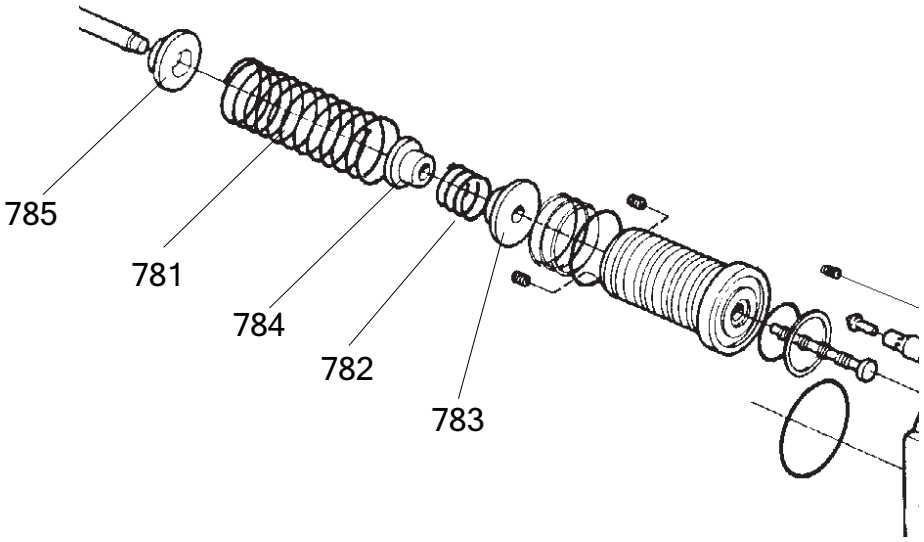
Part no.	Title	Benämning	Qty	
3780957	Valve sleeve assy	Ventilfoder kpl	1	Viton
3780958	Valve sleeve assy	Ventilfoder kpl	1	Nitril

Items included in the Valve Sleeve Kit are 719, 720, 771, 772, 774 and 775.

Housing Type AH Kit

Part no.	Title	Benämning	Qty	
3794896	Housing Type ISO Assy	Hus Typ ISO Kpl	1	
3795946	Housing Type ISO Assy	Hus Typ ISO Kpl	1	Viton
3794916	Housing Type SAE Assy	Hus Typ SAE Kpl	1	
3795890	Housing Type SAE Assy	Hus Typ SAE Kpl	1	Viton

Items included in the Housing Type AH Kit are 741, 742, 743, 744, 746 and 747.



AC and AH

Item	Title	V12-60	V12-80	V12-110	V12-160	Remarks
781	Compression spring	3793602	3793280	3793721	3795584	Đp = 15 bar
781	Compression spring	3793722	3793723	3793724	3794686	Đp = 25 bar
781	Compression spring	3792179	3792180	3792181	3792182	Đp = 50 bar
782	Feed back Spring	3793281	3793281	3793281	3793281	p = 140 - 400 bar
783	Spring seat	3792172	3792172	3792172	3792172	
784	Spring seat	3792173	3792173	3792173	3792173	
785	Spring guide	3791511	3791511	3709406	3709848	

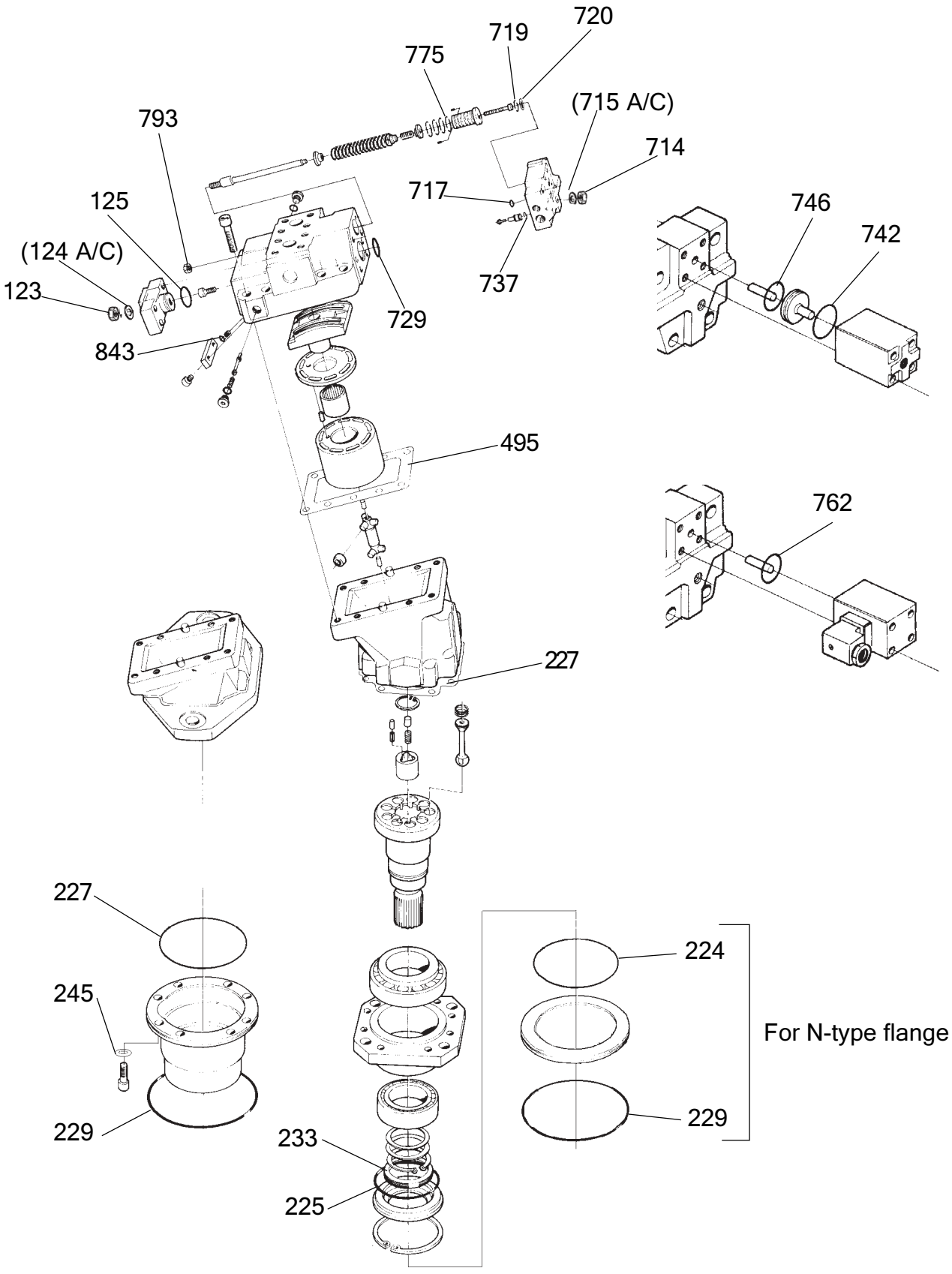
HO and HP

Item	Title	V12-60	V12-80	V12-110	V12-160	Remarks
781	Compression spring	3793602	3793280	3793721	3795584	Đp = 15 bar
781	Compression spring	3793722	3793723	3793724	3794686	Đp = 25 bar
782	Feed back Spring	3793725	3793725	3793725	3793725	p = 5 - 25 bar
783	Spring seat	3792172	3792172	3792172	3792172	
784	Spring seat	3792173	3792173	3792173	3792173	
785	Spring guide	3791511	3791511	3709406	3709848	

Note! For HO Controls Items 781 and 785 are excluded.

EO and EP

Item	Title	V12-60	V12-80	V12-110	V12-160	Remarks
781	Compression spring	3792175	3791547	3791548	3791549	Đi = 300mA
782	Feed back Spring	3792077	3792077	3792077	3792077	i = 100 - 230mA
783	Spring seat	3792172	3792172	3792172	3792172	
784	Spring seat	3792173	3792173	3792173	3792173	
785	Spring guide	3791511	3791511	3709406	3709848	

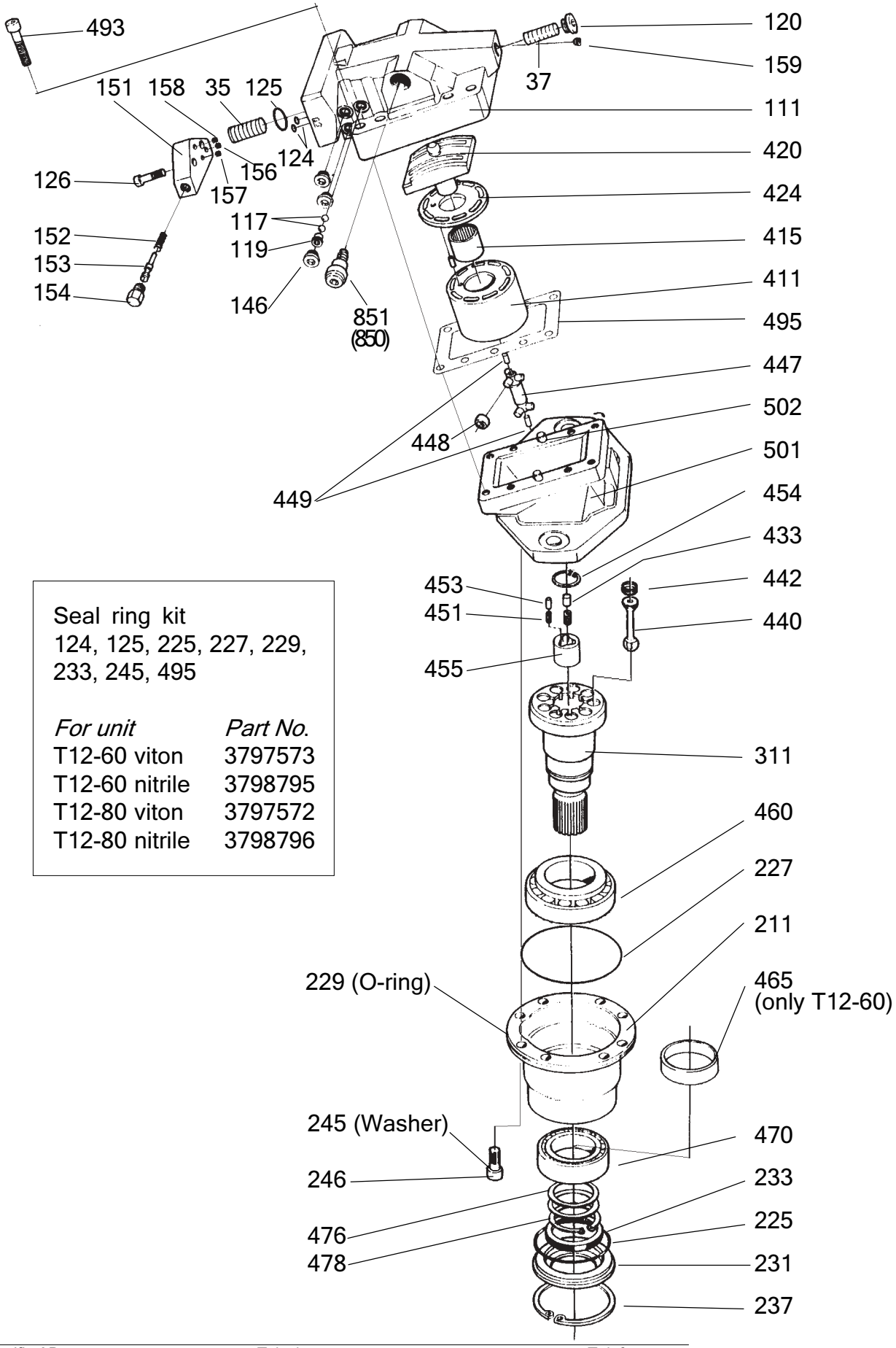

720
719
775
(715 A/C)
793
714
717
125
746
742
(124 A/C)
737
123
729
843
495
762
227
227
245
224
For N-type flange
229
233
225

Item	Part No	Title	Benämning	Qty	Remarks
	3794855	Sealing Kit Type H	Tätningssats Typ H		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	960170	O-Ring	O-Ring	1	
224	925263	O-Ring	O-Ring	1	
225	925258	O-Ring	O-Ring	1	
227	3791854	Gasket	Packning	1	
227	3796540	O-Ring	O-Ring	1	
229	925265	O-Ring	O-Ring	1	
229	3792913	O-Ring	O-Ring	1	
229	3794351	O-Ring	O-Ring	1	
233	3795084	Shaft Seal	Tätningsring	1	
245	947083	Seal Washer	Tätbricka	8	
495	3791772	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	960159	O-Ring	O-Ring	3	
719	960167	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3792467	O-Ring	O-Ring	1	
737	960159	O-Ring	O-Ring	4	
742	960173	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	942382	O-Ring	O-Ring	1	
775	3792343	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	925055	O-Ring	O-Ring	1	
	3794856	Sealing Kit Type V	Tätningssats Typ V		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	976834	O-Ring	O-Ring	1	
224	948982	O-Ring	O-Ring	1	
225	948981	O-Ring	O-Ring	1	
227	3791854	Gasket	Packning	1	
227	3796541	O-Ring	O-Ring	1	
229	948984	O-Ring	O-Ring	1	
229	976641	O-Ring	O-Ring	1	
229	3794861	O-Ring	O-Ring	1	
233	3793419	Shaft Seal	Tätningsring	1	
245	947083	Seal Washer	Tätbricka	8	
495	3791772	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	976823	O-Ring	O-Ring	3	
719	976831	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3793611	O-Ring	O-Ring	1	
737	976823	O-Ring	O-Ring	4	
742	976837	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	3798231	O-Ring	O-Ring	1	
775	3793534	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	968757	O-Ring	O-Ring	1	

Item	Part No	Title	Benämning	Qty	Remarks
	3794857	Sealing Kit Type H	Tätningssats Typ H		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	960170	O-Ring	O-Ring	1	
224	925263	O-Ring	O-Ring	1	
225	925258	O-Ring	O-Ring	1	
227	925266	O-Ring	O-Ring	1	
227	3791854	Gasket	Packning	1	
229	925265	O-Ring	O-Ring	1	
229	3792875	O-Ring	O-Ring	1	
229	3794351	O-Ring	O-Ring	1	
233	3795084	Shaft Seal	Tätningsring	1	
245	947083	Seal Washer	Tätbricka	8	
495	3709997	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	960159	O-Ring	O-Ring	3	
719	960167	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3792510	O-Ring	O-Ring	1	
737	960159	O-Ring	O-Ring	4	
742	960173	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	942382	O-Ring	O-Ring	1	
775	3792343	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	925055	O-Ring	O-Ring	1	
	3794858	Sealing Kit Type V	Tätningssats Typ V		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	976834	O-Ring	O-Ring	1	
224	948982	O-Ring	O-Ring	1	
225	948981	O-Ring	O-Ring	1	
227	949736	O-Ring	O-Ring	1	
227	3791854	Gasket	Packning	1	
229	948984	O-Ring	O-Ring	1	
229	976642	O-Ring	O-Ring	1	
229	3794861	O-Ring	O-Ring	1	
233	3793419	Shaft Seal	Tätningsring	1	
245	947083	Seal Washer	Tätbricka	8	
495	3709997	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	976823	O-Ring	O-Ring	3	
719	976831	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3793533	O-Ring	O-Ring	1	
737	976823	O-Ring	O-Ring	4	
742	976837	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	3798231	O-Ring	O-Ring	1	
775	3793534	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	968757	O-Ring	O-Ring	1	

Item	Part No	Title	Benämning	Qty	Remarks
	3795371	Sealing Kit Type H	Tätningssats Typ H		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	960171	O-Ring	O-Ring	1	
225	3796540	O-Ring	O-Ring	1	
227	925266	O-Ring	O-Ring	1	
227	3791882	Gasket	Packning	1	
229	3792914	O-Ring	O-Ring	1	
233	3795085	Shaft Seal	Tätningsring	1	
245	947083	Seal Washer	Tätbricka	8	
495	3709817	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	960159	O-Ring	O-Ring	3	
719	960167	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3792379	O-Ring	O-Ring	1	
737	960159	O-Ring	O-Ring	4	
742	960173	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	942382	O-Ring	O-Ring	1	
775	3792343	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	925055	O-Ring	O-Ring	1	
	3795372	Sealing Kit Type V	Tätningssats Typ V		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	976835	O-Ring	O-Ring	1	
225	3796541	O-Ring	O-Ring	1	
227	949736	O-Ring	O-Ring	1	
227	3791882	Gasket	Packning	1	
229	976643	O-Ring	O-Ring	1	
233	3793420	Shaft Seal	Tätningsring	1	
245	947083	Seal Washer	Tätbricka	8	
495	3709817	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	976823	O-Ring	O-Ring	3	
719	976831	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3795349	O-Ring	O-Ring	1	
737	976823	O-Ring	O-Ring	4	
742	976837	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	3798231	O-Ring	O-Ring	1	
775	3793534	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	925055	O-Ring	O-Ring	1	

Item	Part No	Title	Benämning	Qty	Remarks
	3796387	Sealing Kit Type H	Tätningssats Typ H		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	960173	O-Ring	O-Ring	1	
225	3796540	O-Ring	O-Ring	1	
227	3792151	Gasket	Packning	1	
233	3795085	Shaft Seal	Tätningsring	1	
495	3791820	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	960159	O-Ring	O-Ring	3	
719	960167	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3792319	O-Ring	O-Ring	1	
737	960159	O-Ring	O-Ring	4	
742	960173	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	942382	O-Ring	O-Ring	1	
775	3792343	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	925055	O-Ring	O-Ring	1	
	3796388	Sealing Kit Type V	Tätningssats Typ V		
123	3799011	Seal Nut M10	Tätmutter	1	Status D
124	3792367	Seal Washer	Gängtätbricka	1	Status A/C
125	976837	O-Ring	O-Ring	1	
225	3796541	O-Ring	O-Ring	1	
227	3792151	Gasket	Packning	1	
233	3793420	Shaft Seal	Tätningsring	1	
495	3791820	Gasket	Packning	1	
714	3799011	Seal Nut M10	Tätmutter	1	Status D
715	3792367	Seal Washer	Gängtätbricka	1	Status A/C
717	976823	O-Ring	O-Ring	3	
719	976831	O-Ring	O-Ring	1	
720	3793523	Support Ring	Stödring	1	
729	3795400	O-Ring	O-Ring	1	
737	976823	O-Ring	O-Ring	4	
742	976837	O-Ring	O-Ring	1	
746	3794257	Piston Seal Assy	Kolvtätning Kpl	1	
762	3798231	O-Ring	O-Ring	1	
775	3793534	O-Ring	O-Ring	1	
793	3704966	Seal Nut	Tätmutter	1	
843	968757	O-Ring	O-Ring	1	



Seal ring kit
124, 125, 225, 227, 229, 233, 245, 495

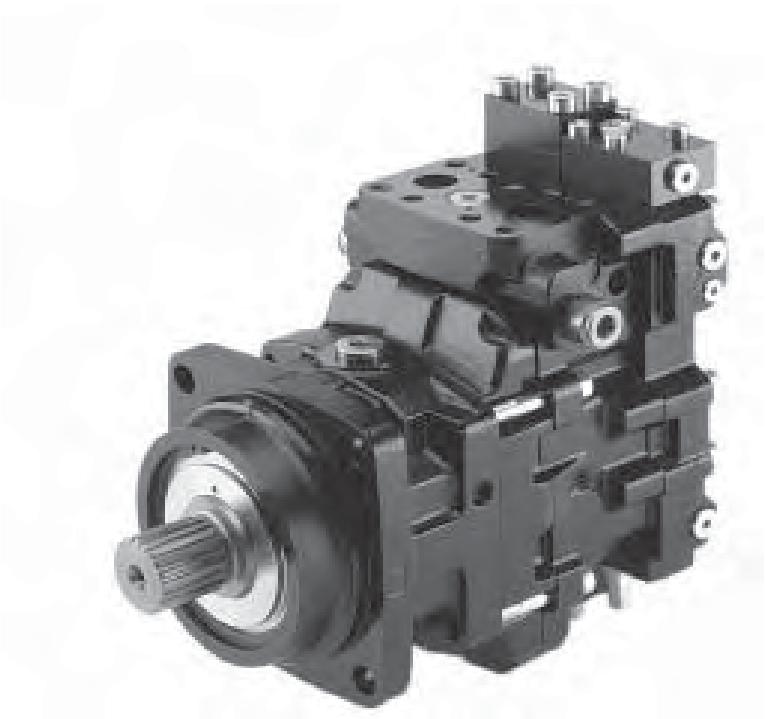
For unit	*Part No.*
T12-60 viton	3797573
T12-60 nitrile	3798795
T12-80 viton	3797572
T12-80 nitrile	3798796

Item	Part No.	Description	Benämning	Qty.	Remarks
35		SETTING PISTON	STÄLLKOLV	1	
37		SETTING PISTON	STÄLLKOLV	1	
111	3795589	END CAP ISO	ANSL.BL.ISO	1	
117	118080	BALL	KULA	2	
119	3795323	VALVE SEAT	VENTILSÄTE	1	
124	3796285	O-RING	O-RING	2	Nitrile
124	3796235	O-RING	O-RING	2	Viton
125	3707383	O-RING	O-RING	1	Nitrile
125	3793701	O-RING	O-RING	1	Viton
126	974109	HEX S SCR	INS SKRUV	2	
146	3793532	HEX SOCK. PL.ASSY	INSEXPROPP KPL	1	
151	3780956	CONTROL COVER	REGULATORLOCK	1	Repl. 3795538
152	3794993	COMPRESSION SPRING	TRYCKFJÄDER	1	
153	3795000	VALVE SPOOL	VENTILSLID	1	
154	3795756	COUPLING RIM VITO	KOPPLING RIM VITO	1	
157	3704588	NOZZLE	MUNSTYCKE	1	
158	3704588	NOZZLE	MUNSTYCKE	1	
211	3792297	BEARING HOUSING	LAGERHUS TYP C	1	
225	925258	O-RING	O-RING	1	Nitrile
225	948981	O-RING	O-RING	1	Viton
227	3796540	O-RING	O-RING	1	Nitrile
227	3796541	O-RING	O-RING	1	Viton
229	3792913	O-RING	O-RING	1	Nitrile
231	3791510	SEAL CARRIER	TÄTRINGSHÅLLARE	1	
233	3795084	SHAFT SEAL	TÄTNINGSRING	1	Nitrile
233	3793419	SHAFT SEAL	TÄTNINGSRING	1	Viton
237	914548	RETAINING RING	SPÅRRING	1	
245	947083	SEAL WASHER	TÄTBRICKA	8	
246	3794766	HEX S SCR	INS SKRUV	8	
311	3793747	SHAFT TYPE C	AXEL TYP C	1	
411	3791752	CYLINDER BARREL	CYLINDERTRUMMA	1	
415	184777	NEEDLE BEARING	NÅLBUSSNING	1	
420	3795652	VALVE SEGMENT ASSY	VENTILSEGMENT KPL	1	
424	3793065	SLIDING PLATE	GLIDPLATTA	1	
433	3792348	COMPRESSION SPRING	TRYCKFJÄDER	1	
440	3793583	PISTON ASSY	KOLV KPL	9	
442	3792345	PISTON RING	LAMELLRING	27	
447	3782238	JOINT SHAFT	SYNKRONISERINGSAXEL	1	Repl. 3791518
448	3707534	JOINT ROLLER	RULLE	6	
449	3791502	SUPPORT PIN	STÖDPINNE	2	
451	949802	SPRING PIN	RÖRPINNE	3	
453	3705958	PIN	PINNE	3	
454	3792411	RETAINING RING	SPÅRRING	1	
455	3791513	JOINT COUPLING	MEDBRINGARE	1	
460	184687	TAP ROL BEARING	KON RULLAGER	1	
465	3791763	SPACER SLEEVE	DISTANSHYLSA	1	
470	184760	CYL BEARING	CYL LAGER	1	
476	974190	SPACER WASHER 0,5	DISTANSBRICKA 0,5	1	
476	974191	SPACER WASHER 1,0	DISTANSBRICKA 1,0	1	
476	977614	SPACER WASHER 0,6	DISTANSBRICKA 0,6	1	
476	977615	SPACER WASHER 0,8	DISTANSBRICKA 0,8	1	
478	914472	RETAINING RING	SPÅRRING	1	
493	974110	HEX S SC	INS SKRUV	8	
495	3791772	GASKET	PACKNING	1	
501	3793445	INTERMEDIATE HOUSING	MELLANHUS TYP C	1	

Item	Part No.	Description	Benämning	Qty.	Remarks
35		STÄLLKOLV	SETT PISTON	1	
37		STÄLLKOLV	SETT PISTON	1	
111	3795298	ANSL.BL.ISO	END CAP ISO	1	
113	3795603	FÖRSEGLINGSPROPP	SEAL PLUG	2	
117	118080	KULA	BALL	2	
119	3795323	VENTILSÄTE	VALVE SEAT	1	
120	3793606	INSEXPROPP KPL	HEX SOCK. PL.ASSY	1	
124	3796285	O-RING	O-RING	2	Nitrile
124	3796235	O-RING	O-RING	1	Viton
125	3707383	O-RING	O-RING	1	Nitrile
125	3793701	O-RING	O-RING		Viton
126	974109	INS SKRUV	HEX S SCR	2	
146	3791725	INSEXPROPP KPL	HEX SOCKET PLUG ASSY	1	
151	3780956	REGULATORLOCK	CONTROL COVER	1	Repl. 3795538
152	3794993	TRYCKFJÄDER	COMPRESSION SPRING	1	
153	3795000	VENTILSLID	VALVE SPOOL	1	
154	3795328	KOPPLING RIM	COUPLING RIM	1	
157	3704588	MUNSTYCKE	NOZZLE	1	
158	3704588	MUNSTYCKE	NOZZLE	1	
211	3792279	LAGERHUS TYP C	BEARING HOUSING	1	
225	925258	O-RING	O-RING	1	Nitrile
225	948981	O-RING	O-RING	1	Viton
227	925266	O-RING	O-RING	1	Nitrile
227	949736	O-RING	O-RING	1	Viton
229	3792875	O-RING	O-RING	1	Nitrile
231	3791510	TÄTRINGSHÅLLARE	SEAL CARRIER	1	
233	3795084	TÄTNINGSRING	SHAFT SEAL	1	Nitrile
233	3793419	TÄTNINGSRING	SHAFT SEAL	1	Viton
237	914548	SPÅRRING	RETAINING RING	1	
245	947083	TÄTBRICKA	SEAL WASHER	8	
246	949067	INS SKRUV	HEX S SCR	8	
311	3794779	AXEL TYP C	SHAFT TYPE C	1	
411	3709968	CYLINDERTRUMMA	CYLINDER BARREL	1	
415	184093	NÅLBUSSNING	NEEDLE BEARING	1	
420	3795486	VENTILSEGMENT KPL	VALVE SEGMENT ASSY	1	
424	3792896	GLIDPLATTA	SLIDING PLATE	1	
433	3792348	TRYCKFJÄDER	COMPRESSION SPRING	1	
440	3793306	KOLV KPL	PISTON ASSY	9	
442	3791607	LAMELLRING	PISTON RING	27	
447	3782238	SYNKRONISERINGSAXEL	JOINT SHAFT	1	Repl. 3791518
448	3707534	RULLE	JOINT ROLLER	6	
449	3791502	STÖDPINNE	SUPPORT PIN	2	
451	949802	RÖRPINNE	SPRING PIN	3	
453	3705958	PINNE	PIN	3	
454	3792411	SPÅRRING	RETAINING RING	1	
455	3791513	MEDBRINGARE	JOINT COUPLING	1	
460	184660	KON RULLAGER	TAP ROL BEARING	1	
470	184760	CYL LAGER	CYL BEARING	1	
476	974190	DISTANSBRICKA 0,5	SPACER WASHER 0,5	1	
476	974191	DISTANSBRICKA 1,0	SPACER WASHER 1,0	1	
476	977614	DISTANSBRICKA 0,6	SPACER WASHER 0,6	1	
476	977615	DISTANSBRICKA 0,8	SPACER WASHER 0,8	1	
478	914472	SPÅRRING	RETAINING RING	1	
493	973198	INS SKRUV	HEX S SCR	8	
495	3709997	PACKNING	GASKET	1	
501	3792910	MELLANHUS TYP C	INTERMEDIATE HOUSING	1	
502	950588	PINNE	PIN	2	
510	3793606	INSEXPROPP KPL	HEX SOCK. PL.ASSY	1	

Service Manual
V14-110 / 160

Catalog
June 2004, GB



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General information

Series V14 is a new generation of variable displacement motors developed and manufactured by Parker Hannifin, Mobile Controls Division.
The V14 is a further development of our well known V12 motor. It is designed for both open and closed circuits, intended particularly for mobile applications.

New features:

- Increased shaft speeds
- Improved sealing
- Faster control response
- Improved shaft support
- Additional integrated functions added

...mainly thanks to:

- Re-designed piston
- O-ring seals between housings
- Enlarged setting piston
- Increased size control device
- Tapered roller bearings

Important features carried over from previous motors:

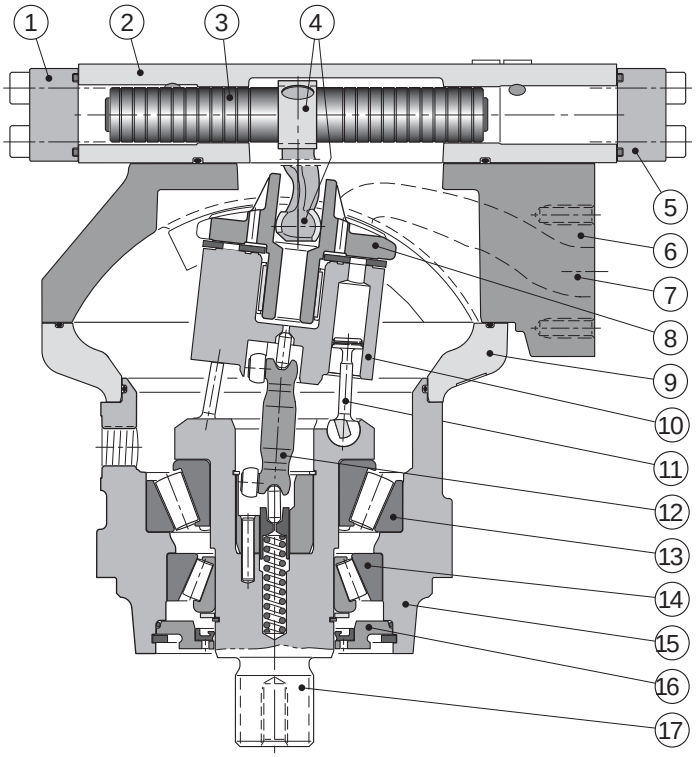
- Operating pressures to 480 bar
- High speeds, thanks to low weight pistons with laminated piston rings and a very compact design of the rotating parts.
- High overall efficiency throughout the entire displacement range
- 9 pistons provide high start-up torque and smooth operation
- Wide displacement range - 5:1
- Small envelope size and high power - to-weight ratio
- Low noise levels due to the compact, sturdy design and smooth fluid passages
- Positive piston locking, strong synchronizing shaft, heavy-duty bearings and a small number of parts add up to a very robust motor with long service life and proven reliability.

Specifications

V14 frame size*	110	160
Displacement [cm³/rev]		
at 35° (max)	110	160
at 6,5° (min)	22	32
Operating pressure [bar]		
max intermittent	480	480
max continuous	420	420
Operating speed [rpm]		
max intermittent at 35° 1)	3900	3400
max continuous at 35°	3400	3000
max intermittent at 6.5°-20° 1)	6500	5700
max continuous at 6.5°-20°	5700	5000
min continuous	50	50
Flow [l/min]		
max intermittent	430	550
max continuous	375	480
Output torque [Nm]		
at 100 bar (theor.)	175	255
Max output power [kW]	262	335
Corner power [kW]		
intermittent	570	730
continuous	440	560
Weight [kg]	54	68

* Additional frame sizes in preparation.
1) Max 6 seconds in any one minute.

V14 cross section



1. End cover, min displ.
2. Control module
3. Setting piston
4. Connecting arm
5. End cover, max displ.
6. Connection module
7. Main pressure port
8. Valve segment
9. Intermediate housing
10. Cylinder Barrel
11. Spherical piston with laminated piston ring
12. Synchronizing shaft
13. Inner roller bearing
14. Outer roller bearing
15. Bearing housing
16. Shaft seal with retainer
17. Output shaft

Displacement limiter V14-110

Setting angle [degree]	Displace-ment [cm³/varv]	Shim maximum side [mm]	Shim minimum side [mm]		Setting angle [degree]	Displace-ment [cm³/varv]	Shim maximum side [mm]	Shim minimum side [mm]
6,5	21,7	58,6	9,1		20,4	67	32,2	35,5
6,9	23	57,9	9,8		20,8	68	31,5	36,2
7,2	24	57,3	10,4		21,1	69	30,9	36,8
7,5	25	56,8	10,9		21,4	70	30,2	37,5
7,8	26	56,2	11,5		21,7	71	29,5	38,2
8,1	27	55,7	12,0		22,1	72	28,9	38,8
8,4	28	55,1	12,6		22,4	73	28,2	39,5
8,7	29	54,6	13,1		22,7	74	27,5	40,2
9,0	30	54,0	13,7		23,0	75	26,9	40,8
9,3	31	53,5	14,2		23,3	76	26,2	41,5
9,6	32	52,9	14,8		23,7	77	25,5	42,2
9,9	33	52,4	15,3		24,0	78	24,8	42,9
10,2	34	51,8	15,9		24,3	79	24,1	43,6
10,5	35	51,3	16,4		24,7	80	23,4	44,3
10,8	36	50,7	17,0		25,0	81	22,7	45,0
11,1	37	50,1	17,6		25,3	82	22,0	45,7
11,4	38	49,6	18,1		25,6	83	21,2	46,5
11,7	39	49,0	18,7		26,0	84	20,5	47,2
12,0	40	48,4	19,3		26,3	85	19,8	47,9
12,3	41	47,9	19,8		26,6	86	19,0	48,7
12,7	42	47,3	20,4		27,0	87	18,3	49,4
13,0	43	46,7	21,0		27,3	88	17,5	50,2
13,3	44	46,2	21,5		27,7	89	16,8	50,9
13,6	45	45,6	22,1		28,0	90	16,0	51,7
13,9	46	45,0	22,7		28,3	91	15,2	52,5
14,2	47	44,4	23,3		28,7	92	14,4	53,3
14,5	48	43,8	23,9		29,0	93	13,6	54,1
14,8	49	43,2	24,5		29,4	94	12,8	54,9
15,1	50	42,7	25,0		29,7	95	12,0	55,7
15,4	51	42,1	25,6		30,0	96	11,2	56,5
15,7	52	41,5	26,2		30,4	97	10,4	57,3
16,0	53	40,9	26,8		30,7	98	9,6	58,1
16,4	54	40,3	27,4		31,1	99	8,7	59,0
16,7	55	39,7	28,0		31,4	100	7,9	59,8
17,0	56	39,1	28,6		31,8	101	7,0	60,7
17,3	57	38,4	29,3		32,1	102	6,1	61,6
17,6	58	37,8	29,9		32,5	103	5,3	62,4
17,9	59	37,2	30,5		32,8	104	4,4	63,3
18,2	60	36,6	31,1		33,2	105	3,5	64,2
18,5	61	36,0	31,7		33,6	106	2,5	65,2
18,9	62	35,4	32,3		33,9	107	1,6	66,1
19,2	63	34,7	33,0		34,3	108	0,7	67,0
19,5	64	34,1	33,6		34,5	108,7	0,0	67,7
19,8	65	33,5	34,2					
20,1	66	32,8	34,9					

Note! There always have to be a shim on the minimum side of the -110cc motor. (9 mm) The -110cc motor will be damaged if set below angles of 6,5°.

Displacement limiter V14-160

Setting angle [degree]	Displace-ment [cm³/varv]	Shim maximum side [mm]	Shim minimum side [mm]		Setting angle [degree]	Displace-ment [cm³/varv]	Shim maximum side [mm]	Shim minimum side [mm]
6,5	31,6	69,2	0,0		20,1	96	39,4	29,8
6,6	32	69,0	0,2		20,3	97	38,9	30,3
6,8	33	68,6	0,6		20,5	98	38,4	30,8
7,0	34	68,1	1,0		20,8	99	37,9	31,3
7,2	35	67,7	1,5		21,0	100	37,4	31,8
7,4	36	67,3	1,9		21,2	101	36,8	32,3
7,6	37	66,8	2,3		21,4	102	36,3	32,9
7,8	38	66,4	2,8		21,6	103	35,8	33,4
8,0	39	66,0	3,2		21,9	104	35,3	33,9
8,2	40	65,5	3,6		22,1	105	34,7	34,5
8,4	41	65,1	4,1		22,3	106	34,2	35,0
8,7	42	64,7	4,5		22,5	107	33,7	35,5
8,9	43	64,2	5,0		22,8	108	33,1	36,1
9,1	44	63,8	5,4		23,0	109	32,6	36,6
9,3	45	63,4	5,8		23,2	110	32,0	37,1
9,5	46	62,9	6,3		23,4	111	31,5	37,7
9,7	47	62,5	6,7		23,6	112	30,9	38,2
9,9	48	62,0	7,2		23,9	113	30,4	38,8
10,1	49	61,6	7,6		24,1	114	29,8	39,3
10,3	50	61,1	8,0		24,3	115	29,3	39,9
10,5	51	60,7	8,5		24,5	116	28,7	40,5
10,7	52	60,3	8,9		24,8	117	28,2	41,0
10,9	53	59,8	9,4		25,0	118	27,6	41,6
11,2	54	59,4	9,8		25,2	119	27,0	42,2
11,4	55	58,9	10,3		25,5	120	26,5	42,7
11,6	56	58,5	10,7		25,7	121	25,9	43,3
11,8	57	58,0	11,2		25,9	122	25,3	43,9
12,0	58	57,6	11,6		26,1	123	24,7	44,5
12,2	59	57,1	12,1		26,4	124	24,1	45,0
12,4	60	56,7	12,5		26,6	125	23,5	45,6
12,6	61	56,2	13,0		26,8	126	22,9	46,2
12,8	62	55,7	13,4		27,1	127	22,4	46,8
13,0	63	55,3	13,9		27,3	128	21,8	47,4
13,3	64	54,8	14,3		27,5	129	21,1	48,0
13,5	65	54,4	14,8		27,7	130	20,5	48,6
13,7	66	53,9	15,3		28,0	131	19,9	49,3
13,9	67	53,5	15,7		28,2	132	19,3	49,9
14,1	68	53,0	16,2		28,4	133	18,7	50,5
14,3	69	52,5	16,7		28,7	134	18,1	51,1
14,5	70	52,1	17,1		28,9	135	17,4	51,7
14,7	71	51,6	17,6		29,1	136	16,8	52,4
14,9	72	51,1	18,1		29,4	137	16,2	53,0
15,2	73	50,7	18,5		29,6	138	15,5	53,6
15,4	74	50,2	19,0		29,9	139	14,9	54,3
15,6	75	49,7	19,5		30,1	140	14,2	54,9
15,8	76	49,2	19,9		30,3	141	13,6	55,6
16,0	77	48,8	20,4		30,6	142	12,9	56,3
16,2	78	48,3	20,9		30,8	143	12,3	56,9
16,4	79	47,8	21,4		31,0	144	11,6	57,6
16,6	80	47,3	21,8		31,3	145	10,9	58,3
16,9	81	46,8	22,3		31,5	146	10,2	58,9
17,1	82	46,4	22,8		31,8	147	9,5	59,6
17,3	83	45,9	23,3		32,0	148	8,9	60,3
17,5	84	45,4	23,8		32,3	149	8,2	61,0
17,7	85	44,9	24,3		32,5	150	7,5	61,7
17,9	86	44,4	24,8		32,7	151	6,8	62,4
18,2	87	43,9	25,3		33,0	152	6,0	63,1
18,4	88	43,4	25,7		33,2	153	5,3	63,9
18,6	89	42,9	26,2		33,5	154	4,6	64,6
18,8	90	42,4	26,7		33,7	155	3,9	65,3
19,0	91	41,9	27,2		34,0	156	3,1	66,1
19,2	92	41,4	27,7		34,2	157	2,4	66,8
19,5	93	40,9	28,2		34,5	158	1,6	67,5
19,7	94	40,4	28,7		34,7	159	0,9	68,3
19,9	95	39,9	29,3		35,0	160,2	0,0	69,2

Ordering code

Example: **V14 - 110 - S V S - EP I 1 A - P 350 - N - 00 - 110 / 032 - 210**
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

1. Frame size
   - **110** - 110 cm³/rev
   - **160** - 160 cm³/rev
2. Mounting flange
   - **C** - Cartridge (Cartridge version only -110)
   - **I** - ISO (ISO version)
   - **S** - SAE (SAE version)
3. Shaft seal
   - **H** - NBR (nitrile)
   - **V** - FPM (fluorocarbon)
4. Shaft end
   - **C** - DIN (ISO version)
   - **D** - DIN (ISO version)
   - **S** - SAE (SAE version)
5. Control
   - **AC** - Pressure compensator
   - **AH** - Pressure compensator with hydraulic override
   - **AD** - Pressure compensator with electric override and break defeat
   - **EO** - Electrohydraulic, two position
   - **EP** - Electrohydraulic, proportional
   - **HO** - Hydraulic, two-position
   - **HP** - Hydraulic, proportional
6. Control signal
   - **E** - External pressure (HO, HP)
   - **H** - 24 VDC (EO, EP)
   - **L** - 12 VDC (EO, EP)
   - **I** - Internal pressure (AC, AD)
7. Control restrictor set
   - **1** - 0,7
   - **2** - 0,8
   - **3** - 1,0 (standard)
   - **4** - 1,2
   - **x** - special
8. Control modulating pressure/current
   - **N** - AC, AD: 0 bar; EP: non-selectable current
   - **A** - 15 bar (AC, AD, HP)
   - **C** - 50 bar (AC, AD)
9. Valve options
   - **N** - None
   - **B** - Brake valve and pressure relief valves (only -110)
   - **L** - Flushing valve
   - **P** - Pressure relief valves
10. Pressure relief valve opening pressure [bar] or Flushing valve restrictor
11. Sensor options
    - N - None
    - C - Prepared for setting piston position and shaft speed sensors (EP)
    - D - Speed and setting piston position sensors (EP)
    - L - Setting piston position sensor (EP)
    - P - Prepared for speed sensor
    - S - Speed sensor
    - T - Prepared for setting piston position sensor (EP)
12. Factory issued number for special versions
13. Max displacement [cm³/rev]
14. Min displacement [cm³/rev]
15. Threshold setting
    - **AC:** select pressure between 100 and 350 [bar]
    - **EO,EP:** 12 VDC: 400 [mA]
      24 VDC: 200 [mA]
    - **HO,HP:** Factory set at 10 [bar]
      Is adjustable between 5 - 25 [bar]

Motor installation

Direction of rotation

The V14 motor is bi-directional. Fig. 1 shows shaft rotation vs. direction of flow.

When the A port is pressurized (black arrow) the motor turns counter clockwise (left hand, L, rotation), and when the B port is pressurized (open arrow) the shaft turns clockwise (right hand, R, rotation).

Note: Before installing the V14 in series (when the A and B ports can be subject to high pressures simultaneously) contact Parker Hannifin (Mobile Controls Div.).

Filtration

Maximum motor service life is obtained when the fluid cleanliness meets or exceeds ISO code 18/13 (ISO 4406).

A 10 µm (absolute) filter is recommended.

Case pressure

The lowest and highest recommended case pressure (V14 with shaft seal type **H**) at selected shaft speeds is shown in the table below.

The min case pressure secures sufficient lubrication, and the max case pressure, which secures nominal seal life, should be measured at the drain port.

Size	1500	3000	4000	5000	6000
V14-110	max 10	1-6	1.5-5	2-4.5	-
V14-160	max 10	1-6	2-5.5	2.5-5.5	-

Min and max case pressure [bar] vs. shaft speed [rpm].

Note: Contact Parker Hannifin (Mobile Controls Div.) for information on other shaft seals.

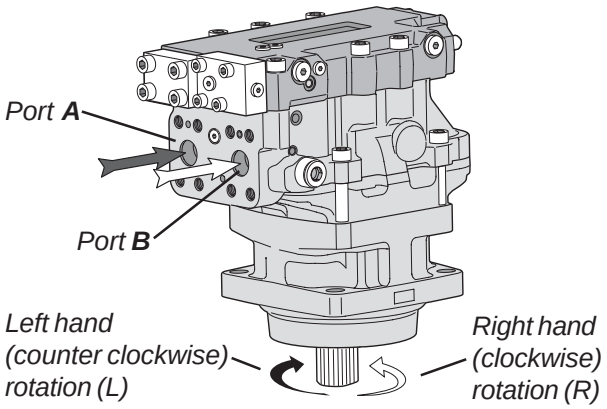


Fig. 1 (motor rotation vs. direction of flow).

Required inlet pressure

The motor operates as a pump under certain conditions. When this occurs, a minimum pressure must be maintained at the inlet port. Increased noise and gradually deteriorating performance due to cavitation may otherwise be experienced.

A 15 bar inlet pressure, measured at the motor inlet port, satisfies most operating conditions.

Contact Parker Hannifin (Mobile Controls Div.) for more specific information on inlet pressure requirements.
Note: For high speed info, see MCD Marketing information database.

Operating temperatures

The following temperatures should not be exceeded (type **H** shaft seal):

Main circuit: 80 °C
Drain fluid: 100 °C

FPM shaft seals (type **V**) can be used to 115 °C drain fluid temperature.

Continuous operation at high power levels usually requires case flushing in order for the fluid to stay above the minimum viscosity requirements.

A flushing valve and restricting nozzle, available as an option, provide the necessary main circuit flushing flow.

Refer to fig. 2 (next page).

Drain ports

There are two drain ports on the V14; the uppermost drain port should always be utilized (fig. 3).
In order to avoid excessively high case pressure, the drain line should be connected directly to the reservoir.

NOTE: When the motor is operating, the case must be filled with fluid to at least 50%.

Hydraulic fluids

Ratings and performance data for series V14 motors are valid when a good quality, contamination-free, petroleum-based fluid is used in the hydraulic system.

Hydraulic fluids type HLP (DIN 51524), automatic transmission fluids type A, or API CD engine oils can be used.

Fire resistant fluids, when used under modified operating conditions, and synthetic fluids are also suitable.

When the hydraulic system has reached full operating temperature, the motor drain oil viscosity should be above 8 mm²/s (cSt).

At start-up, the viscosity should not exceed 1500 mm²/s.

The ideal operating range for the V14 series is 15 to 30 mm²/s.

The following publications (available from Parker Hannifin, Mobile controls Div.) provide additional information:
MI 180 - Hydraulic fluid specifications
MI 189 - Fire resistant fluids

Before start-up

Make sure the motor case as well as the entire hydraulic system is filled with hydraulic fluid. The internal leakage, especially at low operating pressures, is not sufficient to provide lubrication at start-up.

Note:

A drain line spring loaded check valve (shown in fig. 2, 3 and 4) may have to be installed in order to prevent oil from being siphoned out of the motor case. This can otherwise happen e.g. if the reservoir is located below the utilized motor drain port.

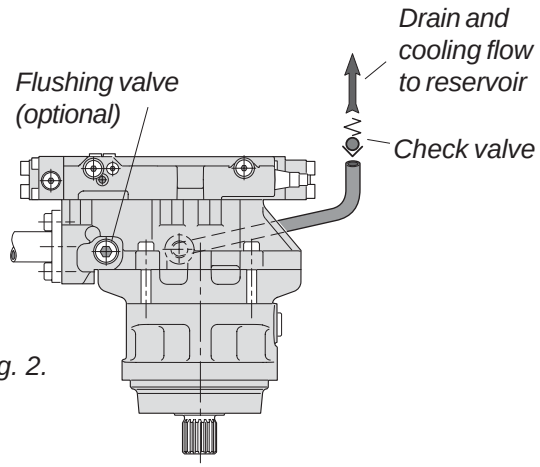


Fig. 2.

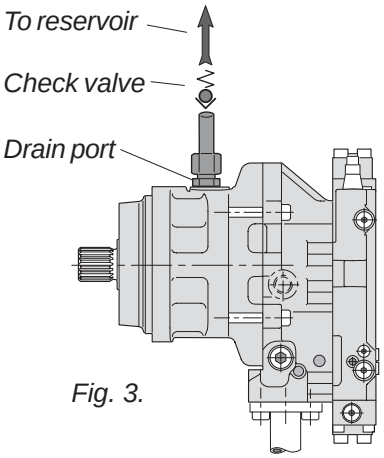


Fig. 3.

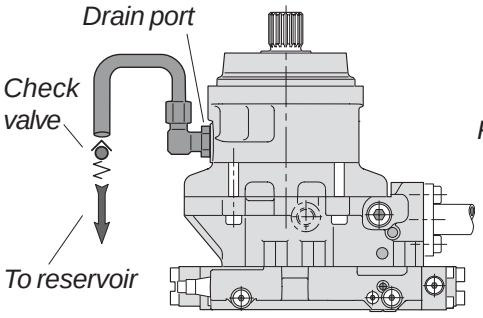


Fig. 4.

Controls - general information

The following controls satisfy most application requirements:
- AC (automatic pressure compensator)
- AD (Automatic pressure compensator with electric override and brake defeat)
- AH (automatic pressure compensator with hydraulic override
- EO and HO (two position controls)
- EP and HP (proportional controls)

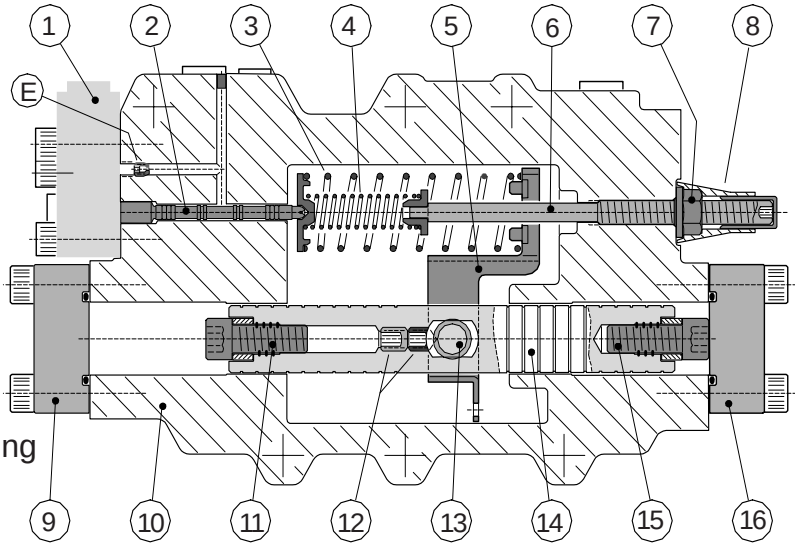
All controls utilize a servo piston that connects to the valve segment (refer to the illustration on page 4).
The built-in four-way servo valve determines the position of the servo piston and, in turn, the displacement.

The displacement angle (between output shaft and cylinder barrel) ranges from 35° (max) to 6.5° (min).
Servo supply pressure is obtained from the pressurized, main port through the corresponding, built-in shuttle valve.
The respons time (i.e. from max-to-min or from min-to-max displacement) is determined by restrictors in the servo valve supply and return lines; refer to the schematics.

AC control description

1. AC control cover
2. Servo valve spool
3. Modulating spring
4. Threshold spring
5. Feedback arm
6. Threshold adjustment screw
7. Seal nut
8. Two-part threshold seal
9. End cover (max displ.)
10. Control module housing
11. Max displ. limiting screw/bushing
12. Set screws
13. Connecting arm
14. Setting piston
15. Min displ. limiting screw/bushing
16. End cover (min displ.)

E. Restrictor location, servo supply

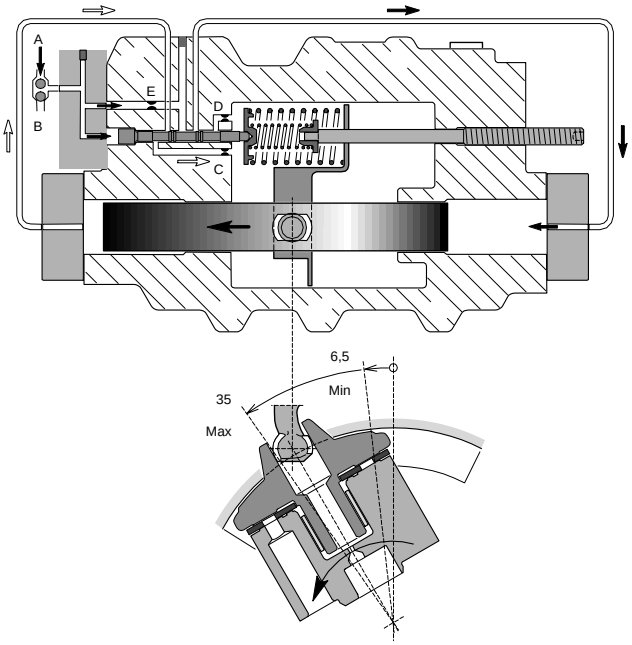


AC control module cross section (as seen from motor intermediate housing / control module interface).

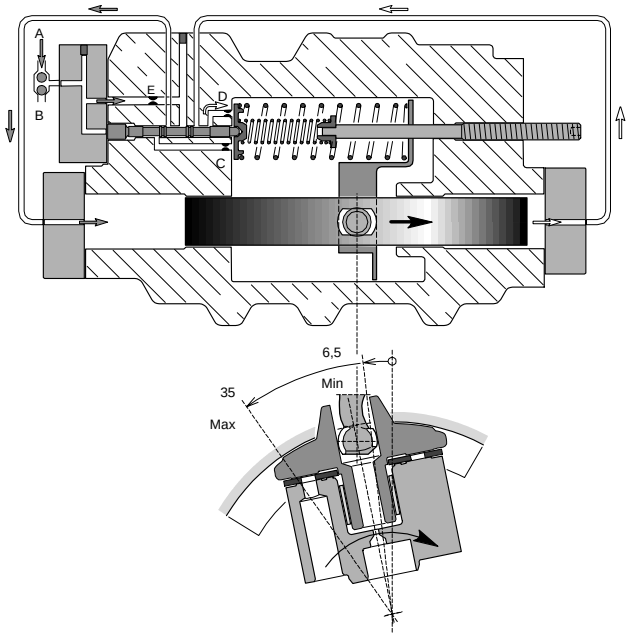
AC control function

Refer to the illustration below left:
When pressure in port A (or B) increases, the servo valve spool is pushed to the right, directing flow to the right hand setting chamber - the setting spool moves to the left; displacement and output torque increases. At the same time, the shaft speed decreases correspondingly (at a constant pump flow to the motor).

Refer to the illustration below right:
When pressure in port A (or B) decreases, the servo valve spool moves to the left, directing flow to the left hand setting chamber - the setting spool moves to the right; displacement and output torque decreases. At the same time, the shaft speed increases correspondingly (at a constant pump flow to the motor).



AC control function (displ. increase at increasing pressure).



AC control function (displ. decrease at decreasing pressure).

AC port and restrictor locations

Port connections and restrictor positions (AC control)

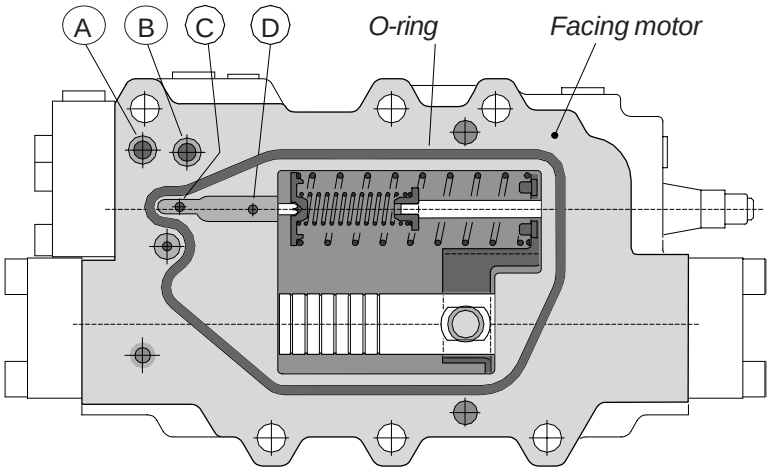
A. Port A connection

B. Port B connection

C. Restrictor position, min-to-max servo pressure (M5)

D. Restrictor location, max-to-min servo pressure (M5)

E. Restrictor location, servo supply (refer to cross section page 9)



Gauge ports AC/AD/AH control

Pressure setting procedure

The pressure setting procedure is valid for all pressure compensators (AC, AD and AH).

WARNING
In order to prevent injury to the technician or the bystanders during the adjustment procedure, all hydraulic functions on the vehicle/machine should be disabled (e.g. wheels raised off the ground, work functions disconnected).
Avoid fast forward/reversed changes that can damage the synchronizing shaft.

1. Make sure that the motor has been supplied with the correct modulating spring (ordering code and name plate information should correspond).

2. Install 0 - 600 bar (0 - 8500 psi) gauges in port X1 and X5; refer to fig. 1.

3. Turn the adjustment screw counter clockwise to ensure that the threshold spring is unloaded.
   The distance between nut and screw end is approximately 23 mm when the threshold spring is unloaded.

Note! The distance between nut and screw end should not be more than 28 mm, because of risk for loosing guiding of the spring.

4. Increase the system pressure (e.g. by blocking the motor shaft) to desired pressure setting (read the pressure in port X5).

5. Start to turn the threshold adjustment screw clockwise until the pressure in gauge X1 starts to increase. Right threshold pressure setting has been reached.

Note: One turn of the setting screw corresponds to 57 bar (820 psi).

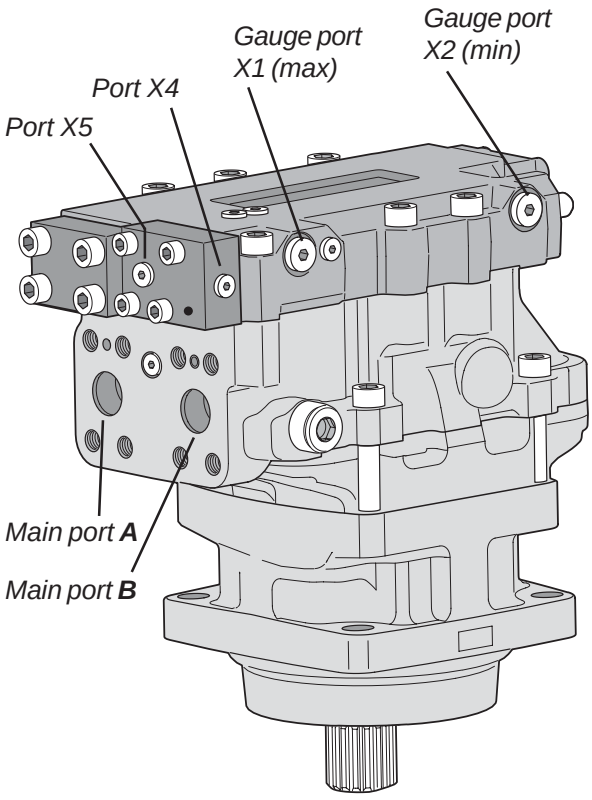


fig. 1

EO/EP/HO/HP control description

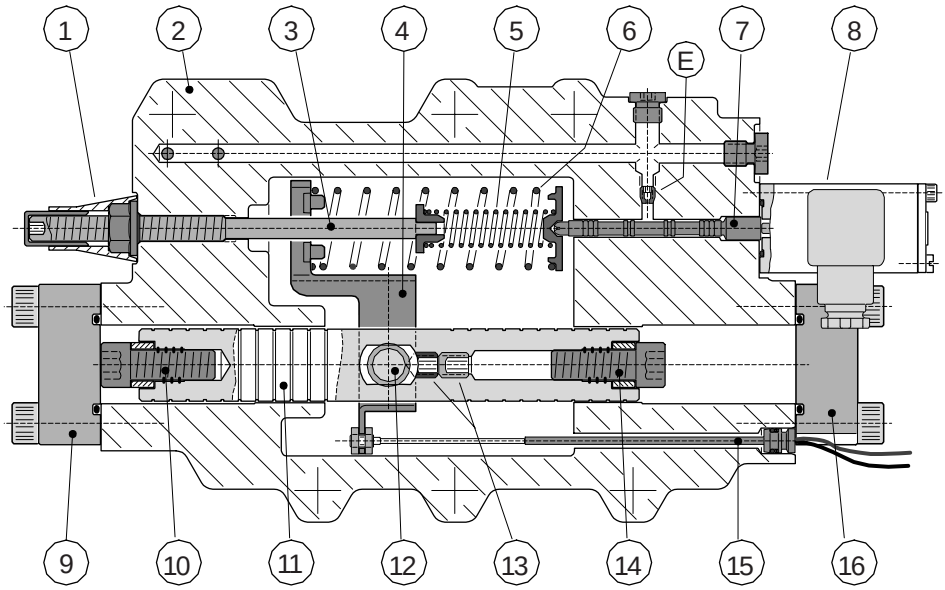
Basically, the controls function in a similar way. At increasing solenoid current (EP) or increasing pilot pressure (HP) the control moves towards the min displacement position. At decreasing current/pilot pressure, the control retracts towards max displacement.

In comparison with EP and HP, the EO and HO controls have no modulating spring or feedback arm; this means that only min and max displacements (but no intermediate positions) are available with these controls.

Module cross section (EP shown)

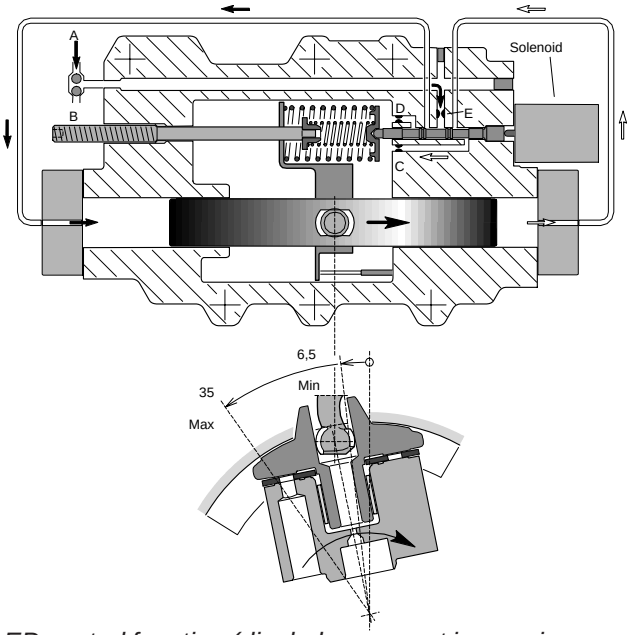
1. Two-part seal
2. Control module housing
3. Treshold adjustment screw
4. Feedback arm (EP, HP only)
5. Treshold spring
6. Modulating spring (EP, HP only)
7. Servo valve spool
8. Solenoid (EO, EP only); cover on HO, HP
9. End cover (max displ. limit)
10. Max displ. limiting screw/bushing
11. Setting piston
12. Connecting arm
13. Set screws
14. Min displ. limiting screw/bushing
15. Setting piston position sensor (EP, EO option)
16. End cover (min displ. limit)

E. Restrictor location, servo supply



EP control function
(solenoid current increasing)

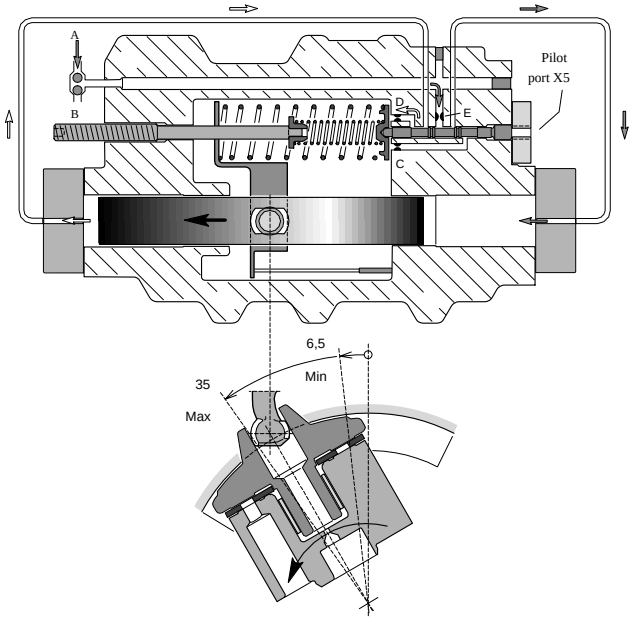
Refer to the illustration below left:
At an increasing current (above the threshold value), the solenoid spool pushes left on the servo valve spool, and flow is directed to the left hand setting chamber - the setting spool moves to the right and the displacement decreases.
This means, that the shaft speed increases while the output torque decreases correspondingly (at a constant pump flow and system pressure).



EP control function (displ. decrease at increasing current).

HP control function
(decreasing pilot pressure)

Refer to the illustration below right:
When the pilot pressure decreases, the pilot piston retracts, the servo valve spool moves to the right and flow is directed to the right hand setting chamber - the setting spool moves to the left and the displacement increases.
The shaft speed now decreases and the available output torque increases correspondingly (at a constant pump flow and system pressure).



HP control function (displ. increase at decreasing pilot pressure).

EO/EP/HO/HP port and restrictor locations

Port connections and restrictor positions (EP control)

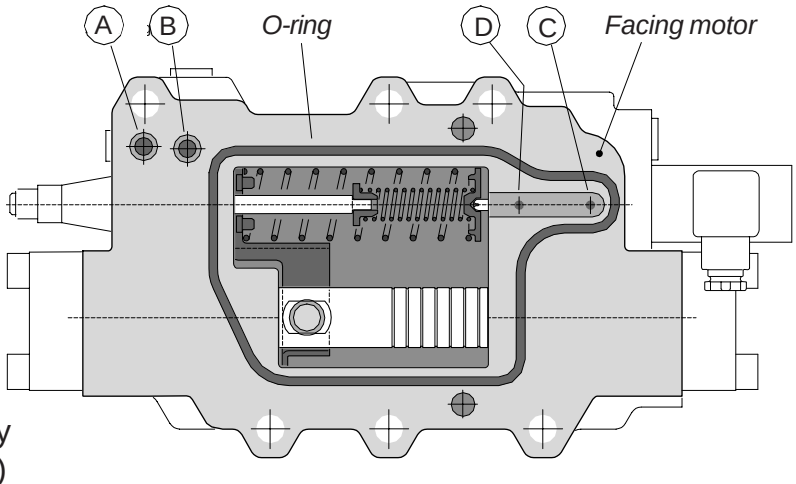
A. Port A connection

B. Port B connection

C. Restrictor position, max-to-min servo pressure

D. Restrictor position, min-to-max servo pressure

E. Restrictor location, servo supply (refer to cross section page 12)



Gauge ports EO/EP/HO/HP

The pressure/current setting procedure is valid for all proportional and two-position controls (EO, EP, HO and HP).

> WARNING
> In order to prevent injury to the technician or the bystanders during the adjustment procedure, all hydraulic functions on the vehicle/machine should be disabled (e.g. wheels raised off the ground, work functions disconnected).
> **Avoid fast forward/reversed changes that can damage the synchronizing shaft.**

1. Make sure that the motor has been supplied with the correct modulating spring (ordering code and nameplate information should agree). The hydraulic oil should be 50°C (120°F).

2. Install 0 - 600 bar (0 - 850 psi) gauge in port X2. Use a 0 - 60 bar (0 - 850 psi) gauge to measure pilot pressure if it is a HO or HP.

3. Turn the adjustment screw counter clockwise to ensure that the threshold spring is unloaded. The distance between nut and screw end is approximately 22 mm when the threshold spring is unloaded.

Note! The distance between nut and screw end should not be more then 27 mm, because of risk for loosing guiding of the spring.

HO or HP controls

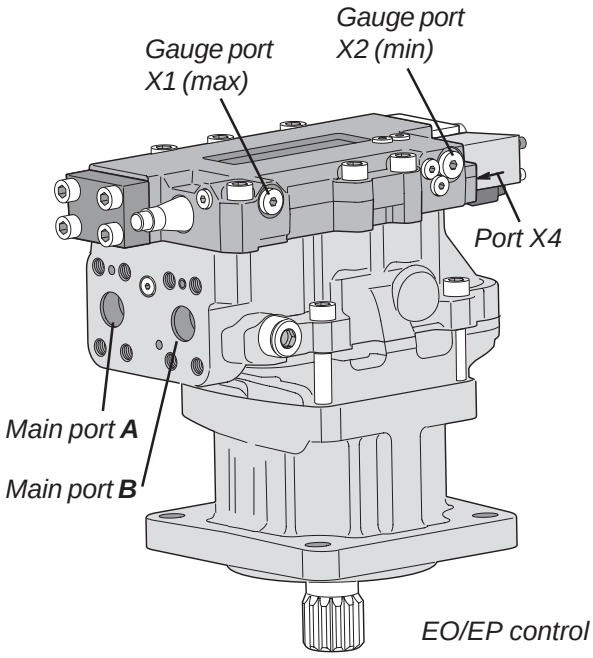
4. Pressurize port X5 to desired threshold (the control goes to min displ.). Standard factory setting is 10 bar. Optional setting is 5 - 25 bar.

EO or EP controls

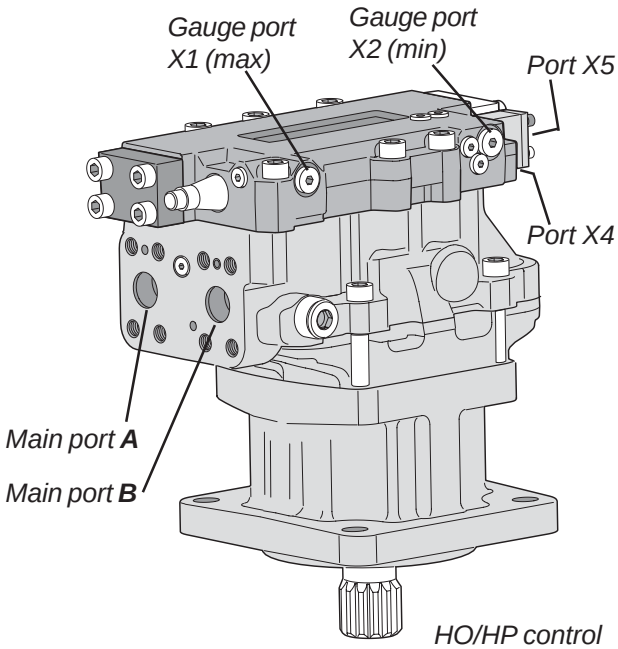
4. Apply the desired threshold current to the solenoid (the control goes to min displ.). Standard factory setting is
   400 mA (12 VDC)
   200 mA (24 VDC)

5. Start to turn the threshold adjustment screw clockwise until the pressure in gauge X2 starts to increase. Right threshold pressure setting has been reached.

Note: One turn of the setting screw corresponds to:
- 40 mA on 12 VDC solenoids (EO, EP)
- 20 mA on 24 VDC solenoids (EO, EP)
- 2,1 bar (30 psi) on HO and HP controls



EO/EP control



HO/HP control

V14 Displacement limiter

Max and min displacement limiter consists of a socket head cap screw and a displacement spacer or spacers, see fig. 1. Suitable screw lengths for a particular max or min displacement range are shown in the table 1 below.

Displacement spacer (s) [mm]	*Socket head cap screw*	*Parker No.*
0 - 24	M12 x 45	968131
25 - 39	M12 x 60	3707695
40 - 60	M12 x 80	3782519

Table 1

What length the max or min displacement spacer should have to obtain a chosen displacement is shown on page 5 and 6. The displacement spacers are available in five different lengths: 0,5; 1; 2; 5 and 10 mm. To obtain the right displacement, the spacers can be combined with each other's. The thinnest spacer has to be mounted closest to the setting piston, and the others in increasing length order.

Formula for determining the setting angle (a) at a selected displacement D_a:

$$\sin a = (D_a/D_{35}) * \sin 35°$$

where: D_{35} is max displacement at 35°

Displacement spacer changing procedure:

1. Disassemble the max or min end cover by loosen the four screws for the chosen cover.

2. Loosen the socket head cap screw from setting piston.

   Note! This must be done when the control module is assembled on the motor, otherwise the feedback arm could be damaged.

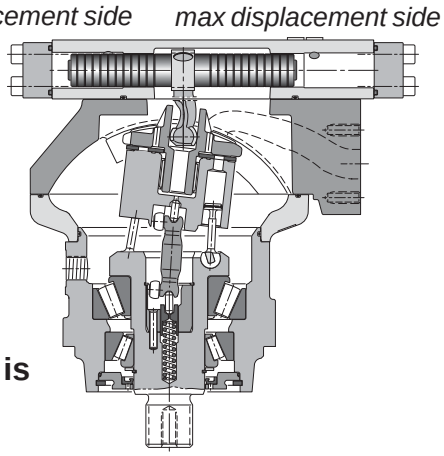


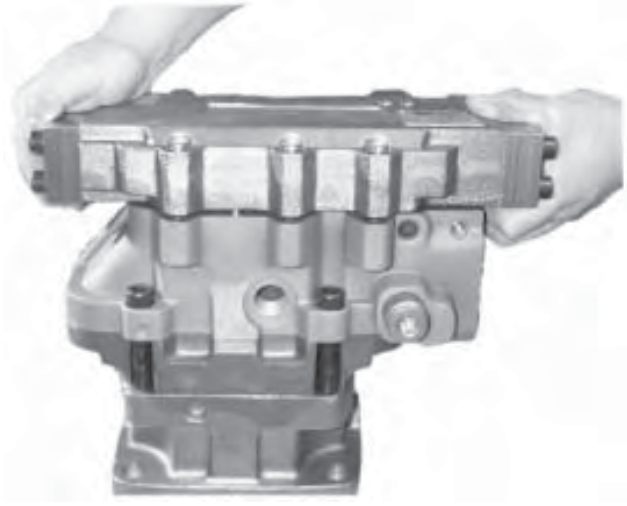
fig. 1.

3. Choose spacer (s) to obtain right displacement, see page 5 and 6, and place them on the socket head cap screw.

4. Tighten the socket head cap screw in the setting piston. The tightening torque have to be 105 ± 20 Nm.

5. Assembly the end cover. The tightening torque have to be 60 ± 10 Nm for the four screws.

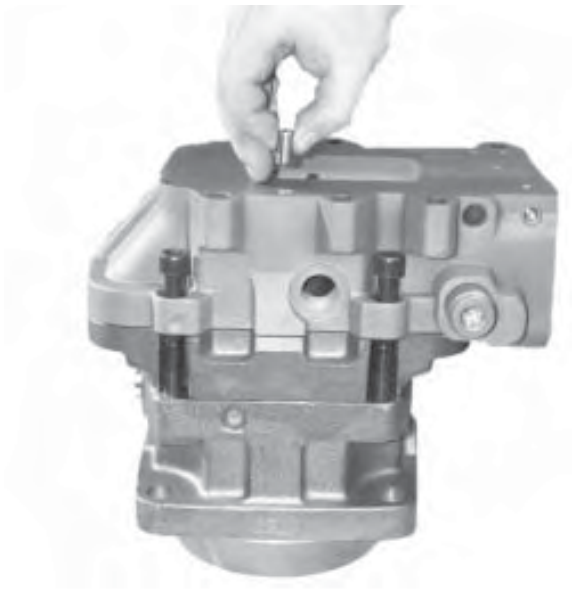
Disassembling



Remove the hexagon screws and lift the control module off.

Important! Lift the control module straight up so the two check valve balls don't fall down into the motor.

Remove the check valve balls.



Be careful, the guide pins can be loose.

Remove the hexagon screws and lift the connection module.

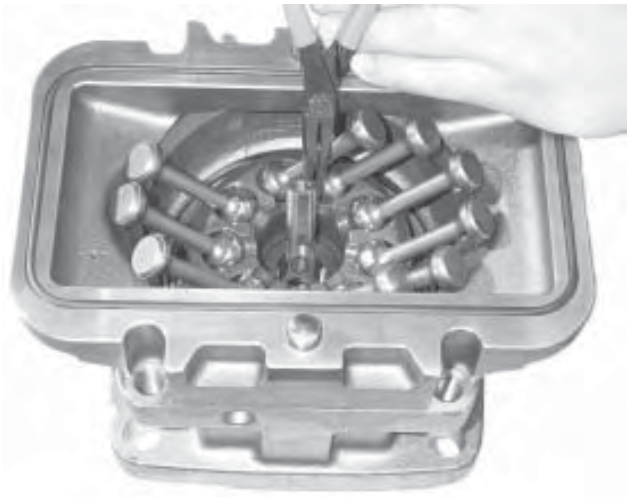
Lift the valve segment.

Remove the cylinder barrel.

Note! The support pin assembled between cylinder barrel and joint shaft might fall down into the motor.

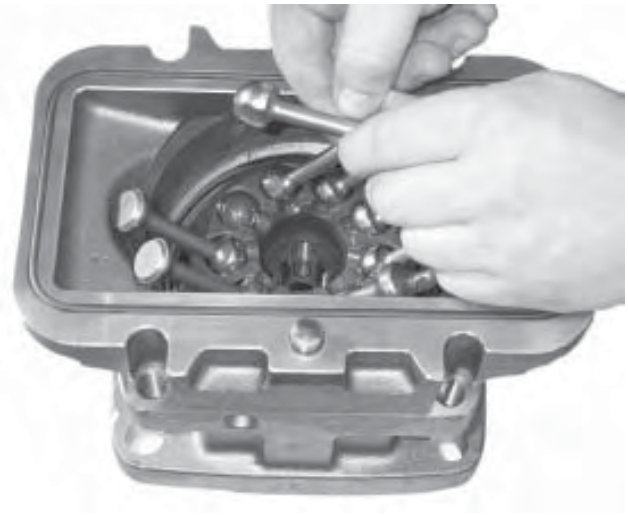
Remove the joint shaft. Make sure all joint rollers follows.

Remove the support pin assembled between joint shaft and guide pin.



Remove the guide pin.

Remove the compression spring.



Remove the pistons and the O-ring fitted on the intermediate housing.
The pistons should be fitted in the same ball sockets as before if you don't exchange the pistons.

Remove the intermediate housing.

Remove the retaining ring.

Remove the seal carrier with shaft seal off. Change the shaft seal. Use the old shaft seal and press down the new shaft seal into the seal carrier.

Remove the O-ring.

Remove the retaining ring.

Use a hydraulic press to remove the shaft.
Place something soft under the shaft to avoid damageing it.

Lift the bearing.
For disassembling the bearing on the shaft use a withdrawing tool.

Assembling

Install the bearing housing on the shaft.
Note! Place the shaft on a distance.

Lubricate the shaft with oil.

Place the bearing on the shaft and press it down.
Note! Be careful when you press so you acheive correct bearing setting, no backlash and a low rolling friction.

Assemble the spacer washer and the retaining ring.

Install the O-ring.

Lubricate the sealing surface with oil on the shaft.

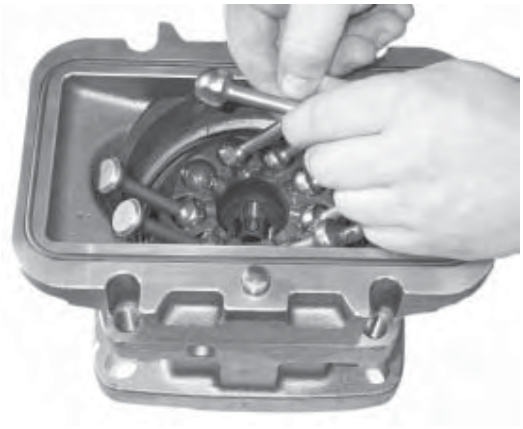
Install the seal ring carrier with shaft seal.

Install the retaining ring.

Install the compression spring.

Install the guide pin.

Install the intermediate housing with O-ring.



Install the pistons. If the pistons isn't exchanged, install them in the same ball sockets as before.

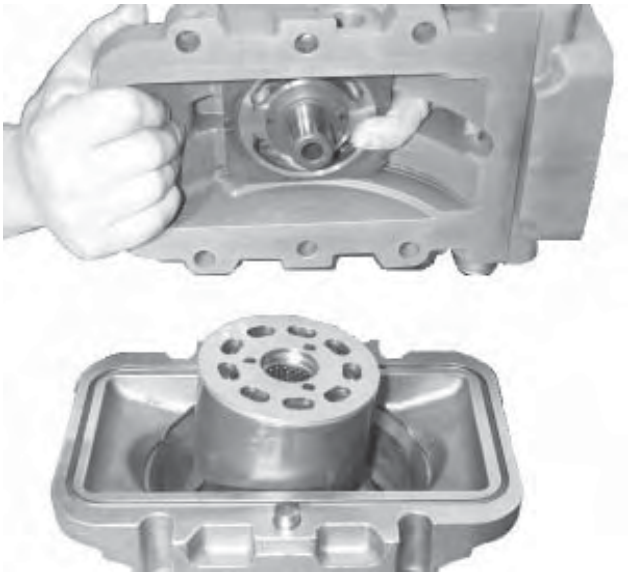
Install the lower support pin.

Install the joint shaft. Put some grease on the joint shaft so the rollers don't fall off. Assemble the rollers with the chamfer inwards.

Install the upper support pin in the cylinder barrel. Put some grease on the pin so it don't fall down when assembling the cylinder barrel.

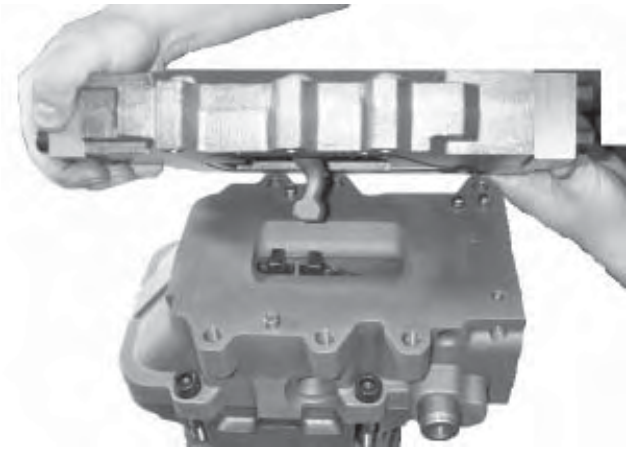
Install the cylinder barrel.
The sliding plate is assembled with the steel side towards the cylinder barrel and the bronze side towards the valve segment.

Make sure that the support pin is in the correct position by using a thin pin and feel that it is in correct position. The support pin shall stand up. It is very important.



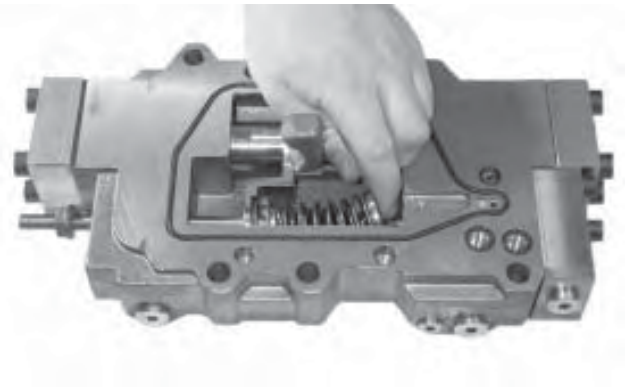
Install the connection module with the valve segment and the hexagon screws,
105 ± 20 Nm (110 cc)
and 175 ± 20 Nm (160 cc).
Note! Be very careful, mind your finger.

Install the check valve balls. Make sure that the guide pins are in place.

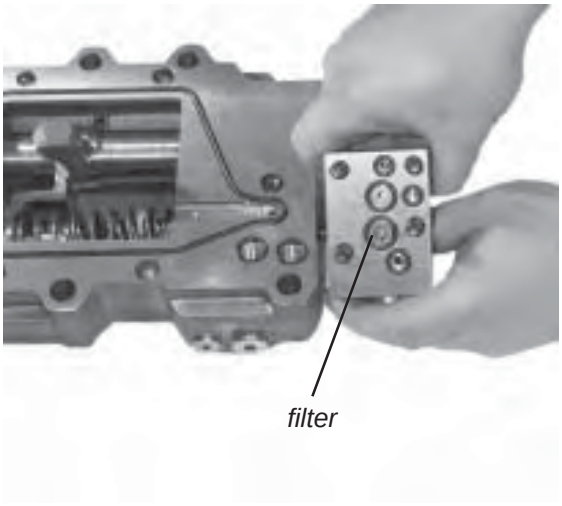


Install the control module, fit the setting piston arm into the valve segment. Tighten the hexagon screws, 105 ± 20Nm.

Change of Control Spring Kit and Filter (AC, AH, AD)



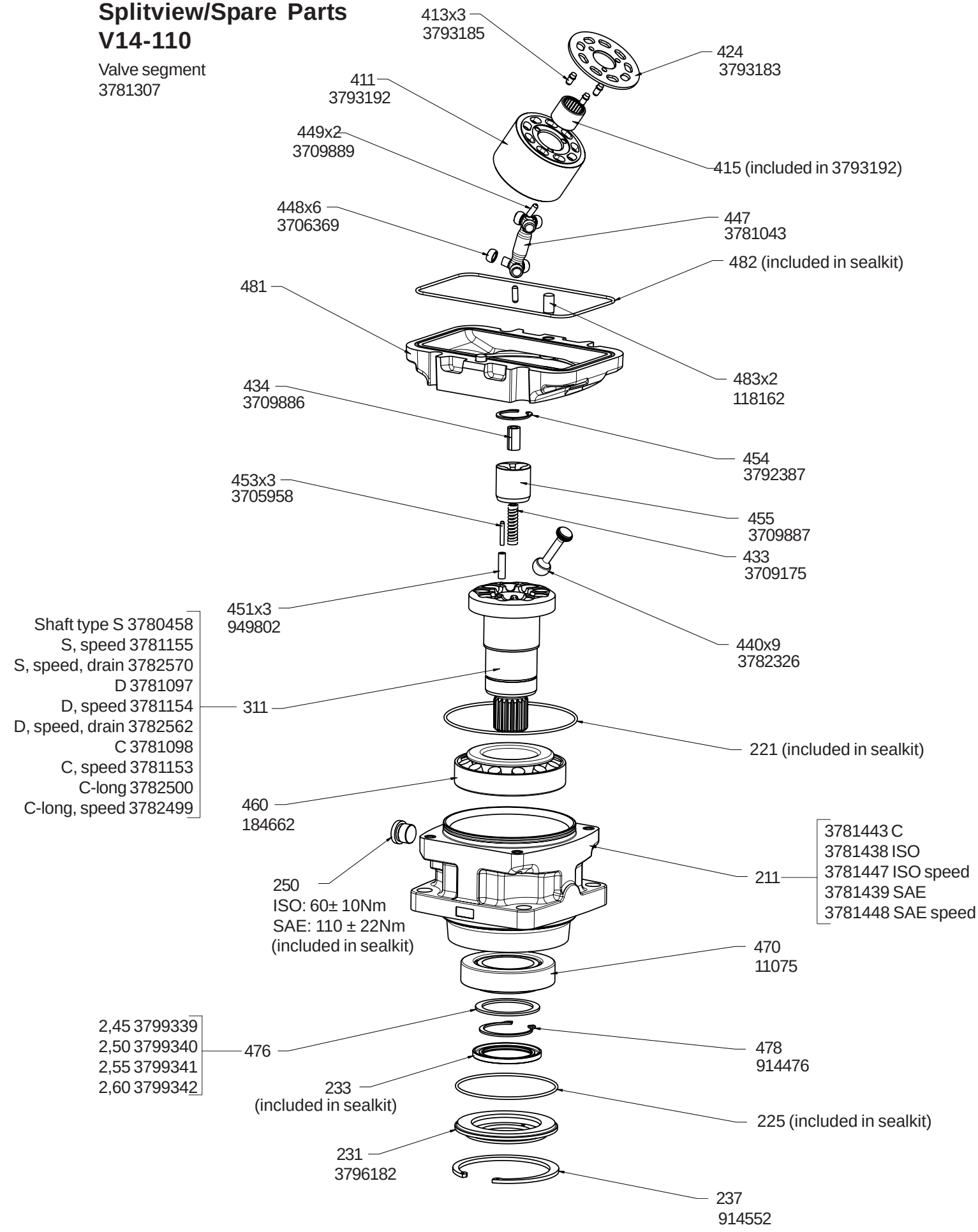
Turn the adjustment screw counter clockwise.
Remove the spring kit.
Change the spring(s).
Put the new spring kit in position and turn the adjustment screw clockwise until the spring is preloaded.



If you need to change the filter remove it and place the new filter with the rounded/meash surface upwards (i.e. the same way as the oil flows).
When the filter has been disassembled it has to be changed.

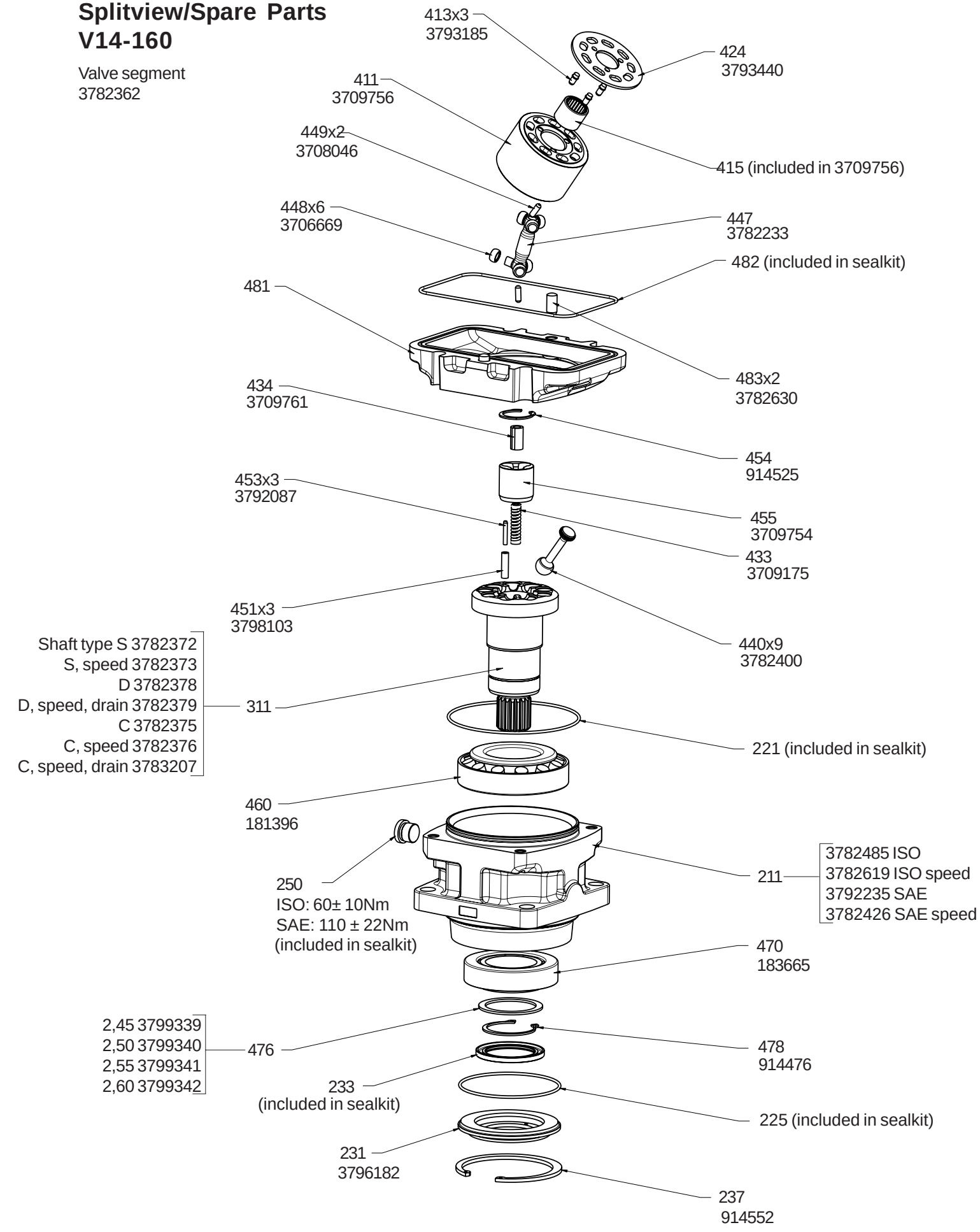
Splitview/Spare Parts V14-110

Valve segment
3781307

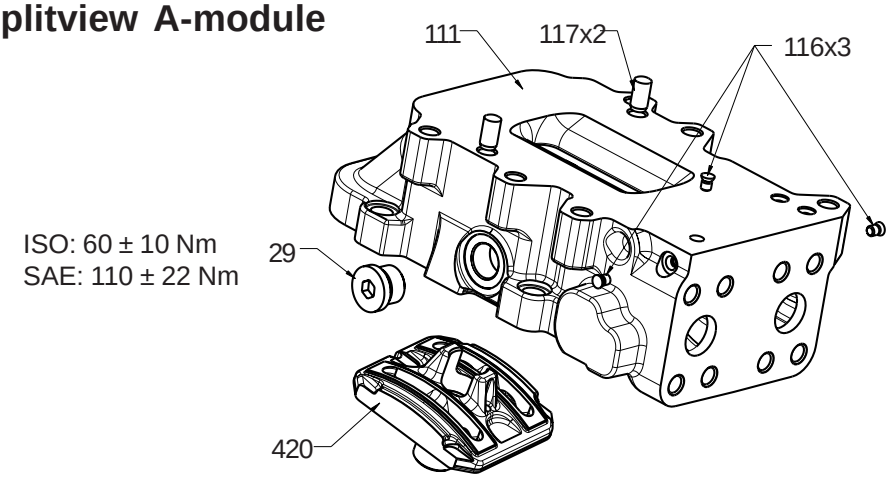


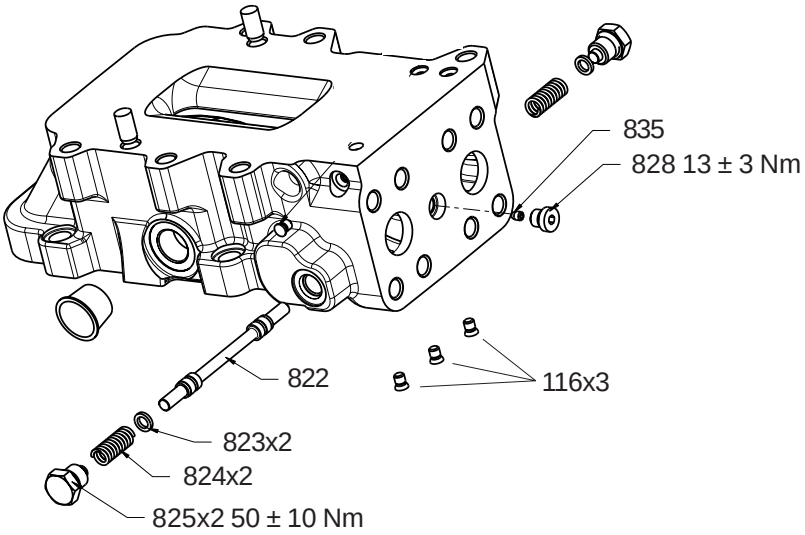
Splitview/Spare Parts V14-160

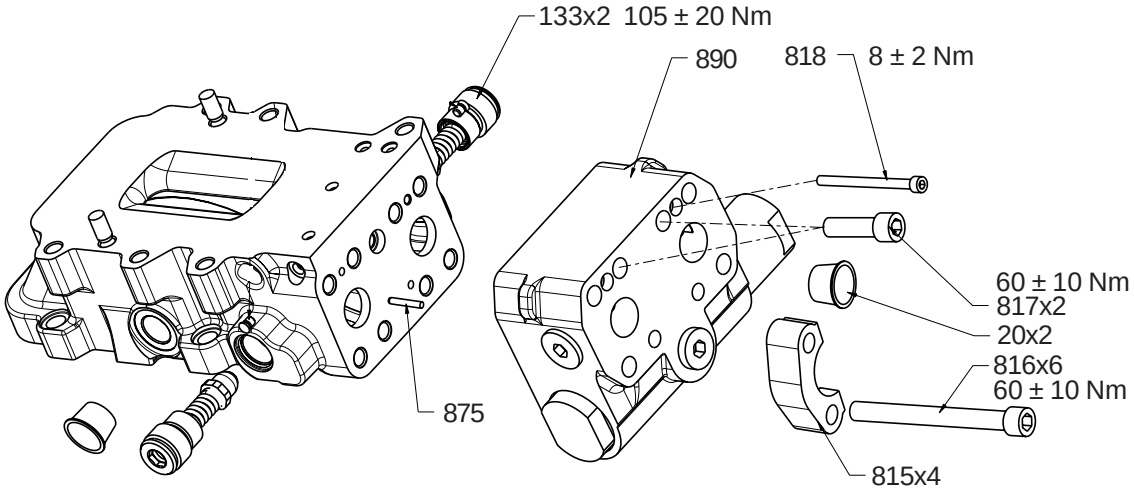
Valve segment
3782362



Splitview A-module

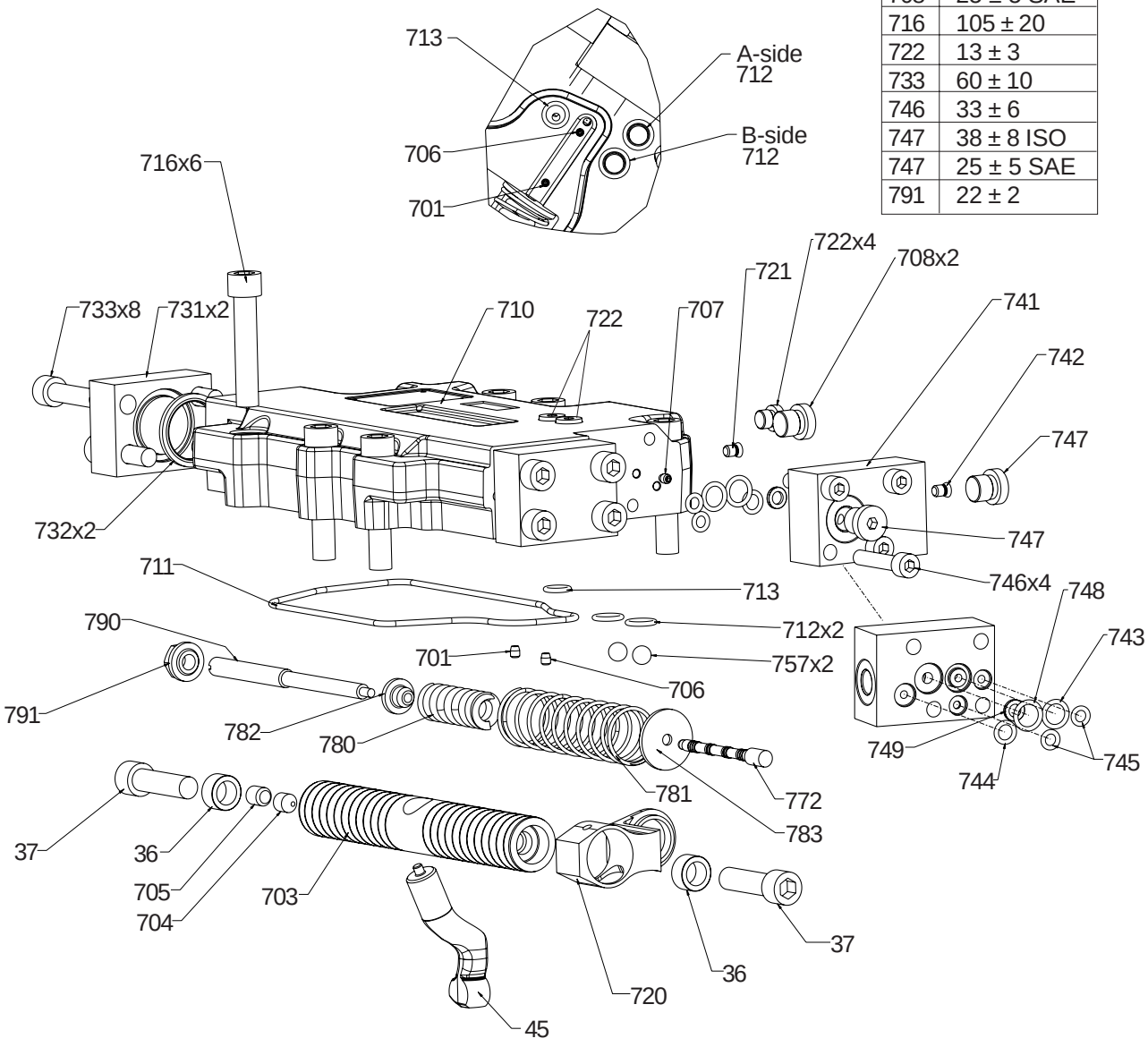






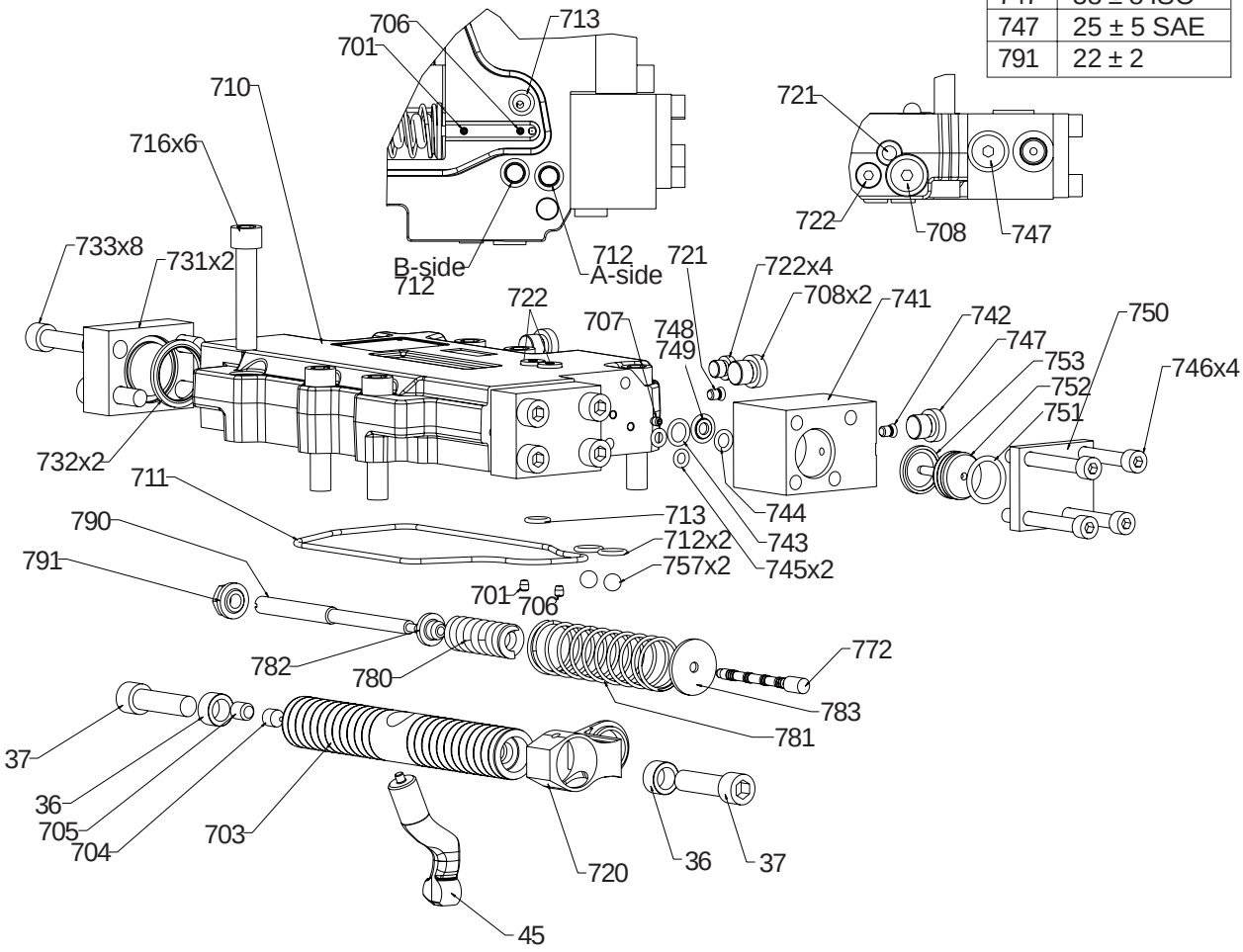
Splitview AC Control

Item	Torque (Nm)
37	105 ± 20
701	1.2 ± 0.2
704	14 ± 4
705	26 ± 6
706	1.2 ± 0.2
707	1.2 ± 0.2
708	38 ± 8 ISO
708	25 ± 5 SAE
716	105 ± 20
722	13 ± 3
733	60 ± 10
746	33 ± 6
747	38 ± 8 ISO
747	25 ± 5 SAE
791	22 ± 2



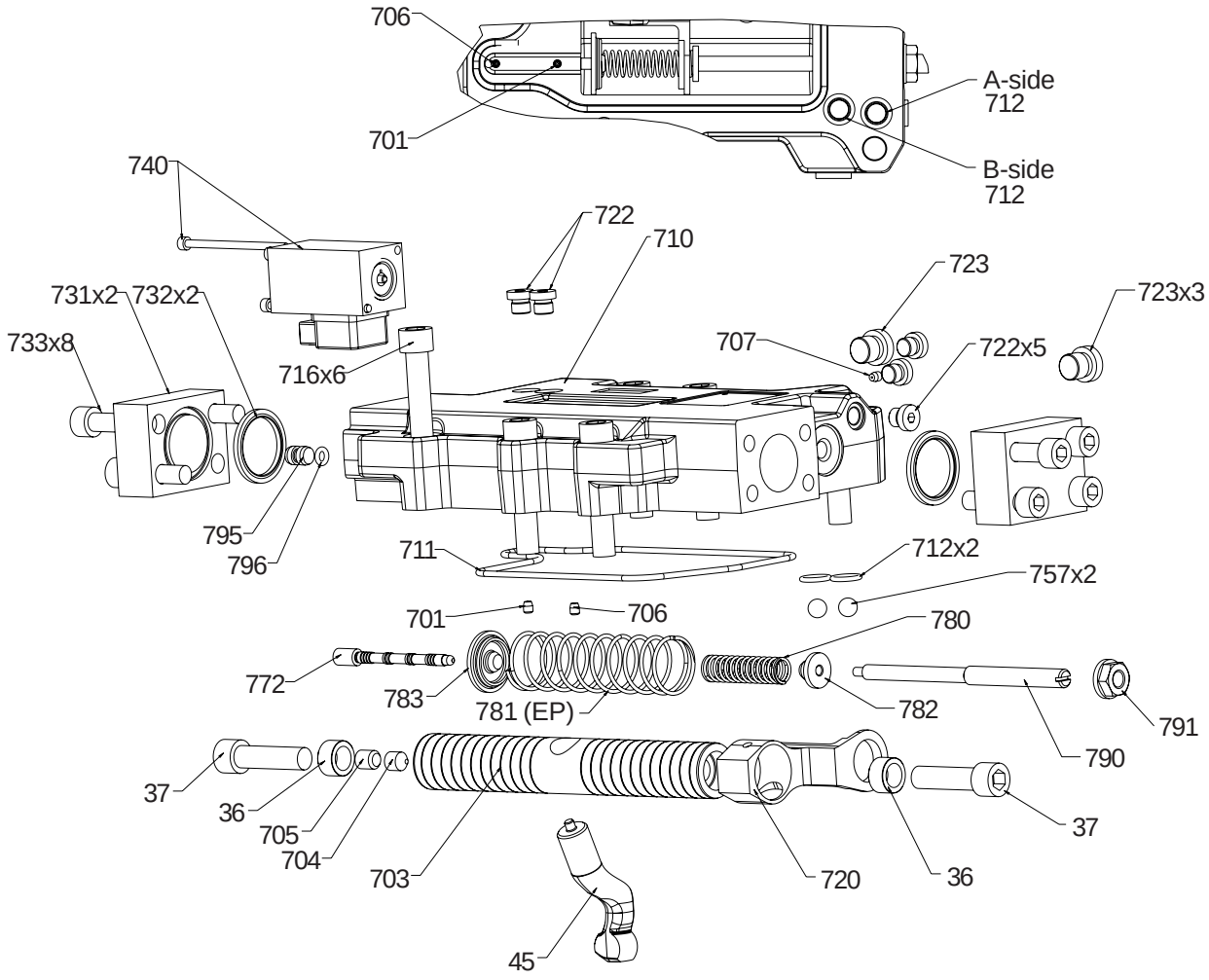
Splitview AH Control

Item	Torque (Nm)
37	105 ± 20
701	1.2 ± 0.2
704	14 ± 4
705	26 ± 6
706	1.2 ± 0.2
707	1.2 ± 0.2
708	38 ± 8 ISO
708	25 ± 5 SAE
716	105 ± 20
722	13 ± 3
733	60 ± 10
746	33 ± 6
747	38 ± 8 ISO
747	25 ± 5 SAE
791	22 ± 2



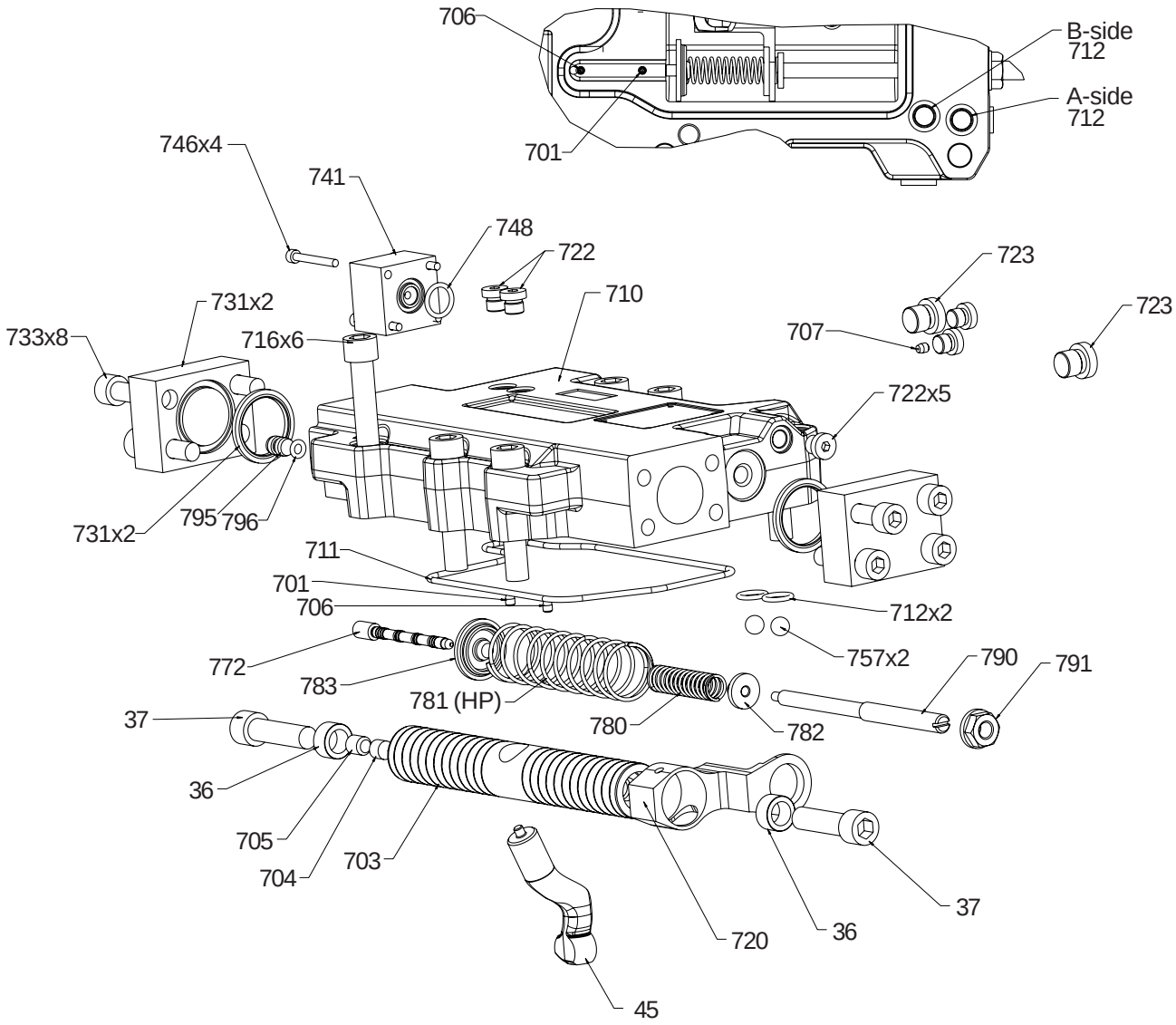
Splitview EP/EO Control

Item	Torque (Nm)
37	105 ± 20
701	1.2 ± 0.2
704	14 ± 4
705	26 ± 6
706	1.2 ± 0.2
707	1.2 ± 0.2
716	105 ± 20
722	13 ± 2
723	38 ± 8 ISO
723	25 ± 5 SAE
733	60 ± 10
740	3 ± 0.5
791	22 ± 2



Splitview HP/HO Control

Item	Torque (Nm)
37	105 ± 20
701	1.2 ± 0.2
704	14 ± 4
705	26 ± 6
706	1.2 ± 0.2
707	1.2 ± 0.2
708	38 ± 8 ISO
708	25 ± 5 SAE
716	105 ± 20
722	13 ± 2
723	38 ± 8 ISO
723	25 ± 5 SAE
733	60 ± 10
746	5 ± 0.5
791	22 ± 2



Spare Part Kits for V14-110/160

Items included in the Seal Kit H.
221, 225, 227, 233, 482, 711, 712, 713, 732, 743, 744, 745, 748, 749, 751, 753, 754, 755, 756, 759, 791

Unit	Part no.
V14-110/160	3782299

Items included in Stop Washer Kit A.
36

Unit	Part no.
V14-110	3782305
V14-160	3782305

Parts Specification

Item	Description	110/160
36	Stop Washer	
221	O-ring 144,5*3 N70 / 168*3 N70	
225	O-ring 114,5*3 N70	
227	O-ring 192*4 N70 (only cartridge)	
233	Shaft Seal 60*80*6	
311	Shaft type C	
411	Cylinder Barrel	
413	Guide Pin	
415	Needle Bearing HK 2526 / HK 3026	
424	Sliding Plate	
433	Compression Spring	
434	Guide Pin	
440	Piston Assy	
447	Joint Shaft	
448	Joint Roller	
449	Support Pin	
451	Spring Pin 8*30 / 10*35	
453	Pin 4,5*28 / 5,6*34	
454	Retaining Ring JV 40 / SGH 45	
455	Joint Coupling	
476	Spacer Washer	
482	O-ring 194,1*3 N70 / 220*3 N70	
711	O-ring 162*3 N70	
712	O-ring 12,3*2,4 N90	
713	O-ring 6,3*2,4 N90	AD
713	O-ring 10,3*2,4 N90	AH/AC
732	Flange Sealing SAE 1”	
743	O-ring 11,3*2,4 N90	
744	O-ring 6,3*2,4 N90	AD
744	O-ring 8,3*2,4 N90	AH/AC
745	O-ring 6,3*2,4 N90	AH/AC
748	O-ring 12,3*2,4 N90	AH/AC
748	O-ring 14,3*2,4 N90	HO/HP
749	Filter	
751	O-ring 22,2*3 N90	
753	Piston Seal Assy	
754	O-ring 10,3*2,4 N90	
755	O-ring 12,3*2,4 N90	
756	O-ring 6,3*2,4 N90	
759	Seal Washer M14	
791	Seal Nut M10*1	

Notes:

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www.parker.com

Catalog
June 2004, GB

Service Manual
ASM 3.1 -VP1
VP1-45, -75

Catalog 9129 8222-06
March 2001, GB

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The VP1 is the worlds first variable displacement pump for truck applications. It can be close-coupled to the power take-off and is especially designed and optimized for truck hydraulic systems that will benefit from variable flow.

Truck cranes is an application that fully utilizes the benefits of a load-sensing system. The complex systems of refuse collection vehicles and sewage trucks as well as various combinations of tipper, crane, snow ploughs and salt/sand spreader can also be greatly simplified and optimized with the VP1 pump.

The VP1 provides the hydraulic system with the correct amount of fluid at precisely the right moment, effectively reducing energy consumption and heat generation. This means a smoother and quieter running system with much reduced impact on the environment.

The VP1 is highly efficient, has a small installation envelop and is extremely light. It is reliable, economical and easy to install.

The two frame sizes, VP1-45 and -75, have the same, small installation dimensions. Shaft and mounting flange follow the European ISO standard 7653-1985.
The VP1 is suitable for all load-sensing systems, ragardless of make.

Features

- Variable displacement
- Energy efficiency
- Low noise level
- High power-to-weight ratio
- Compact and light
- Highly efficient
- Sturdy design
- Withstands low temperatures
- High reliability and serviceability

Design

Large angle - compact design
The pump design permits a large angle, 20°, between piston and slipper shoe/swashplate, providing compactness and small outher dimensions.

Tandem coupling
The through shaft permits tandem coupling of a second pump, such as a series F1 fixed displacement pump.

Accepts external shaft loads
Heavy duty roller bearings allow radial loads to the VP1 shaft end which makes it possible to install a gear directly on the shaft without additional bearings.

Long life
The VP1 is designed for load sensing systems. It is sturdy, yet simple, with few moving parts. The result is a reliable pump with long service life.

Floating valve plate
The design of the VP1 includes a so called 'floating valve plate'. The valve plate 'floats' on five pistons which results in a quieter operating pump with low internal leakage and high volumetric efficiency.

High overall efficiency
Uniquely designed parts like the piston/slipper shoe and floating valve plate minimize mechanical losses and internal leakage, providing a very high overall efficiency.

Retainer plate
The retainer plate (refer to the cross section illustration on page 4) is of a heavy duty design which makes the pump withstand high shaft speeds and fast speed and flow changes.

Specifications

Frame size	VP1-45	VP1-75
Max displacement [cm³/rev]	45	75
Max pressure [bar]		
peak	350	
continuous	300	
Response time [ms]		
max-to-min	20-30	20-40
min-to-max	90-120	100-140
Selfpriming speed [rpm]		
2" suction line, max	2200	1700
2½" suction line, max	2400	2100
Control type	LS	
Splined shaft end	DIN 5462	
Mounting flange	ISO 7653-1985	
Weight (with control) [kg]	27	

Ordering information

Example: **VP1-045-L**

Frame size **045** or **075**

Direction of rotation: **L**-Left hand, **R**-Right hand

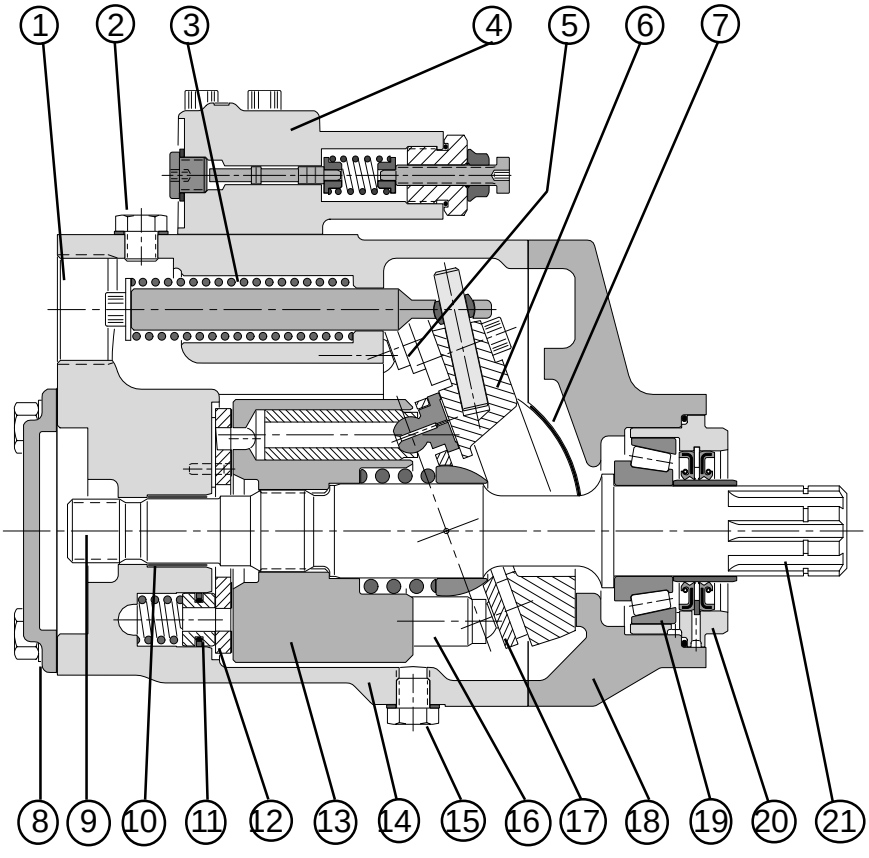
NOTE:
The VP1 is uni-directional. Consequently, the desired direction of rotation must be stated when ordering.

Standard model numbers

VP1-045-R	3780334
VP1-045-L	3780335
VP1-075-R	3780336
VP1-075-L	3780337

VP1 cross section

1. Inlet port
2. 'Top' purge plug
3. Return spring
4. Control
5. Setting piston (one of two)
6. Swash plate
7. Bearing shell
8. End cover
9. Spline (auxiliary pump mounting)
10. Plain bearing
11. Hold-down plunger
12. Bi-metal valve plate
13. Cylinder barrel
14. Barrel housing
15. 'Bottom' purge plug
16. Piston with piston shoe
17. Retainer plate
18. Bearing housing
19. Roller bearing
20. Shaft seals with carrier
21. Input shaft



Installation and start-up

Direction of rotation

The basic VP1 pump is uni-directional; there is a left hand and right hand version (indicated by the arrow on the side of the VP1 pump fig. 4 and 5).
Consequently, the required direction of rotation must be stated when ordering the pump.

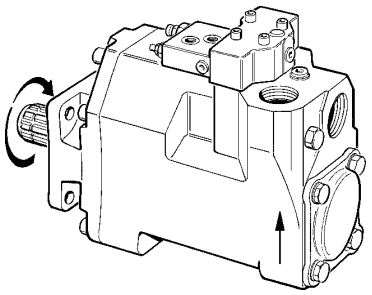


Fig. 4. Left hand rotating pump.

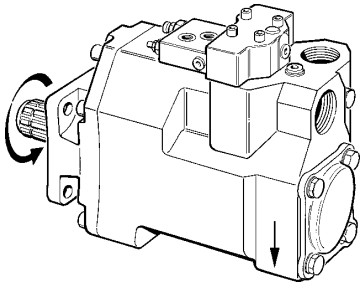


Fig. 5. Right hand rotating pump.

Installation

The VP1 can be installed (close-coupled) directly to a PTO (when manufactured according to ISO DIN 5462).

The pump can be located in any position. Before start-up, the pump must be purged; utilize the uppermost purge plug (fig. 6).

Figure 7 shows two ways of installing a gear on the VP1 shaft. On a non-geared or a geared PTO with support bearings, the pump shaft is usually installed directly in the internally splined PTO output shaft.

IMPORTANT
Force must never be used when installing a coupling, a sleeve or a gear on the VP1 pump shaft. The tool shown in fig. 8 facilitates the installation (our P/N 370 6851).

Before start-up, open the 'bottom' plug, purge the pump, then tighten the plug.

Before start-up, open the 'top' plug, purge the pump, then tighten the plug.

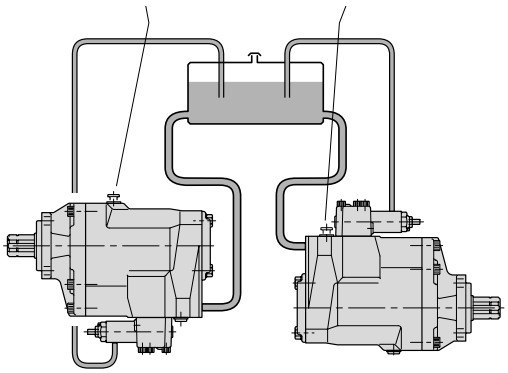


Fig. 6. VP1 should be installed below the reservoir fluid level.

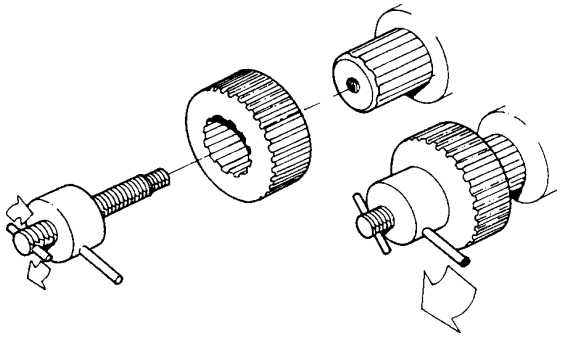


Fig. 8. Installation tool (P/N 370 6851)

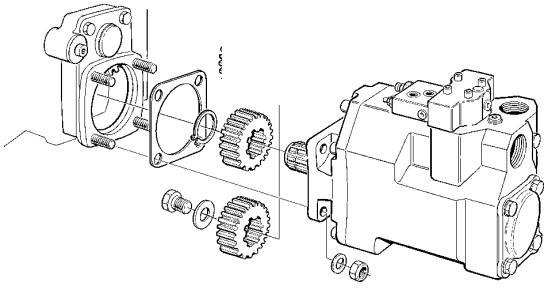
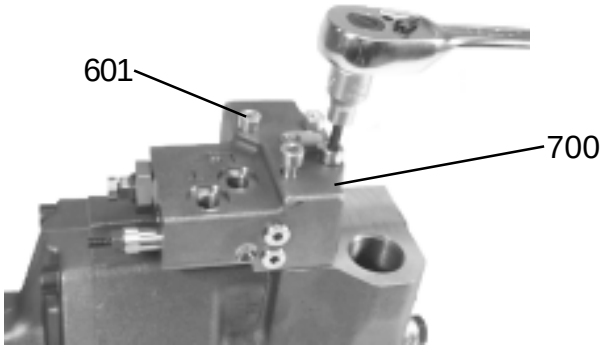
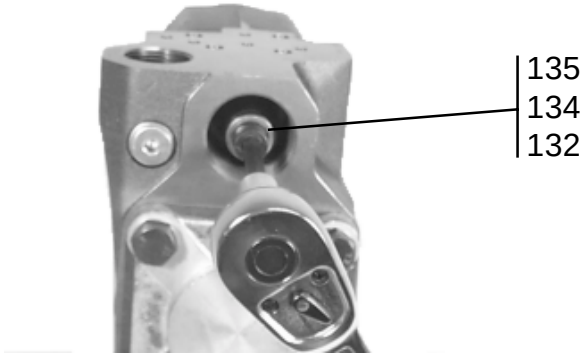


Fig. 7. VP1-to-PTO installation.

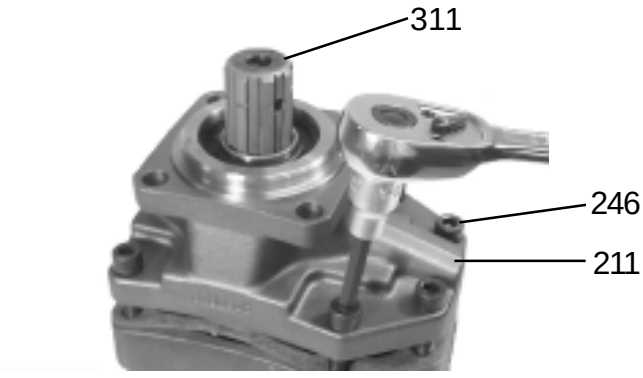
Disassembling



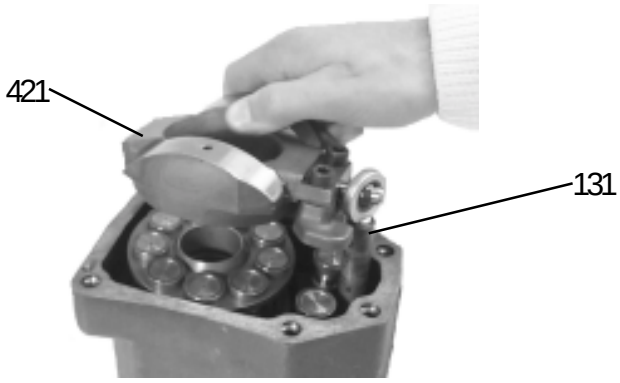
1. Remove the LS Control (item 700).



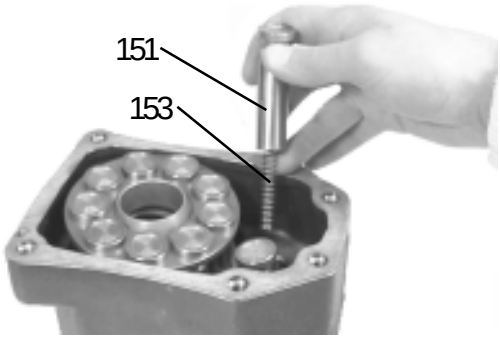
2. Remove the Hex S Screw (item 135), the Washer (item 134) and the Compression Spring (item 132). **Note!** The Bar is loctited with the Pivot Head and it might come loose when removeing the Hex S Screw (item 135).



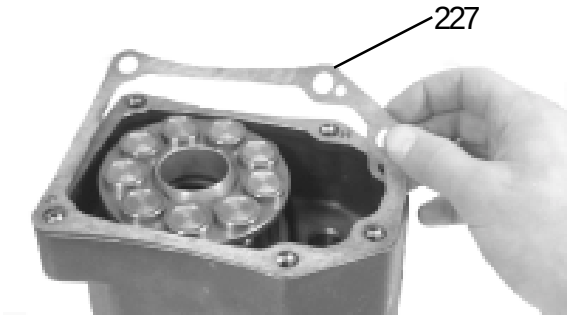
3. Remove the six Hex S Screws (item 246) and lift up the Shaft (item 311) with Bearing Housing (item 211).



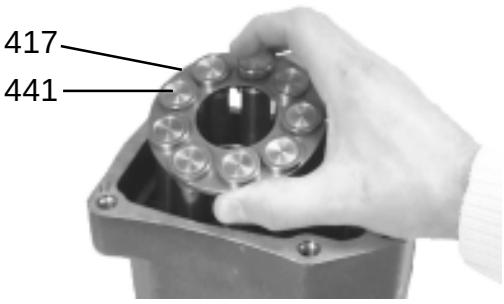
4. Remove the Swashplate (item 421) with Bar Assy (item 131).



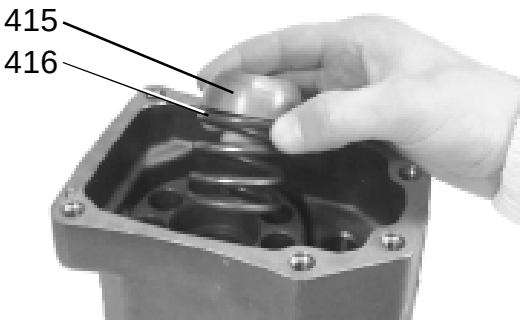
5. Remove the Setting Pistons (item 151) and the Compression Springs (item 153).



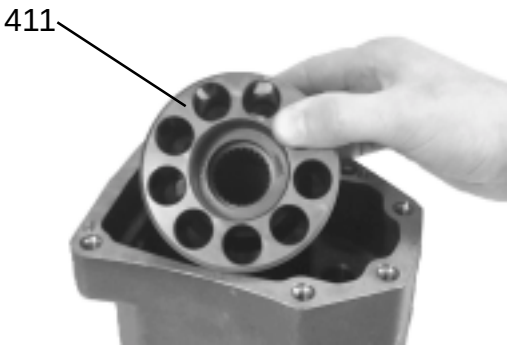
6. Remove the Gasket (item 227).



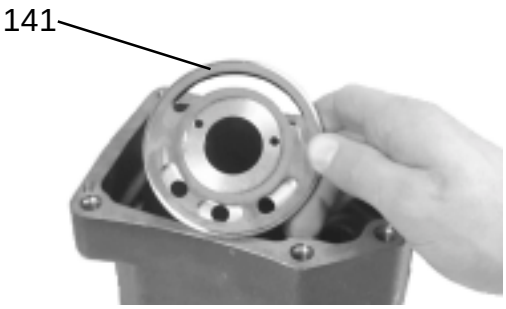
7. Remove the Plate (item 417) with Pistons (item 441).



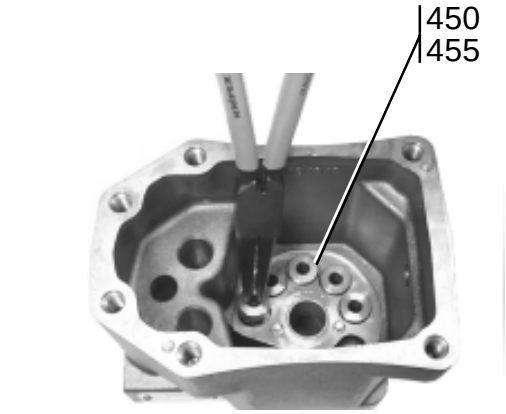
8. Remove the Ball (item 415) and the Compression Spring (item 416).



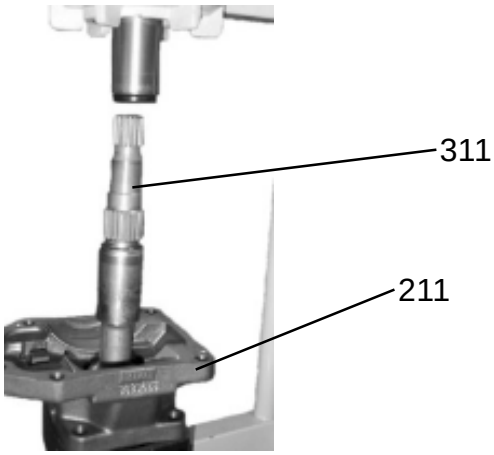
9. Remove the Cylinder Barrel (item 411).



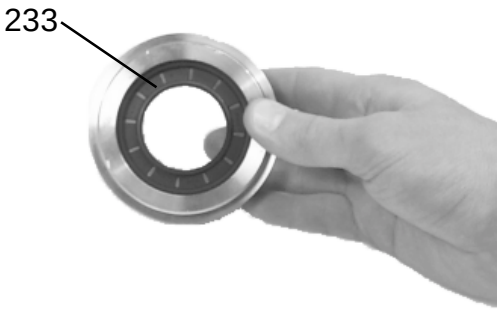
10. Remove the Valve Plate (item 141).



11. Remove the Bushes (item 450) and the Compression Springs (item 455) fitted under the Bushes.



12. Place the Bearing Housing (item 211) on a tube (inside diameter 95 - 110mm) so that the Shaft (item 311) with Seal Carrier (item 231) can be pressed off. Press on the small shaft end. Remove the O-ring (item 225) from the Bearing Housing.



14. Remove the Shaft Seal (item 233).

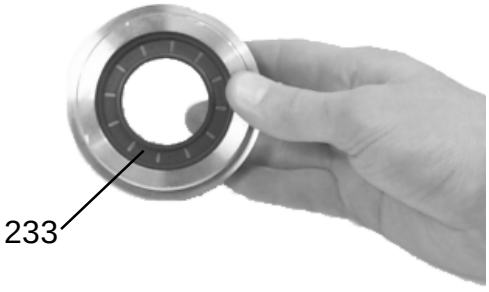
15. Remove the Retaining Ring (item 237). Remove the other Shaft Seal (item 233). If it is necessary to change the Inner Ring (item 471) but not the Bearing (item 470), hit the Inner Ring with a hammer to crack it. Press on a new Inner Ring on the Shaft.

16. If it is nessesary to change the Bearing (item 470), disassemble the Bearing (item 470) and the Inner Ring (item 471) from the shaft by pressing the Bearing and Inner Ring off.

Assembling

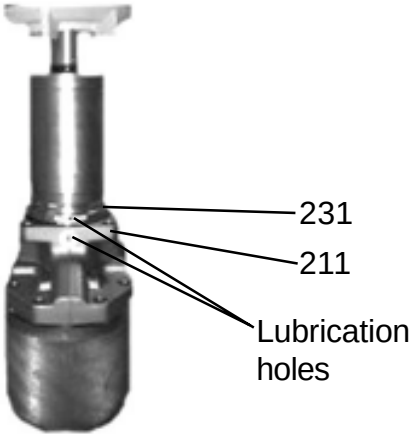
1. Install the Bearing (item 470) and the Inner Ring (item 471) on the shaft.

2. Install the Bearing Ring (item 470). Install the first Shaft Seal (item 233) and the Retaining Ring (item 237). **Note!** locate the opening on the Retaining Ring opposite the drain hole in the Seal Carrier.

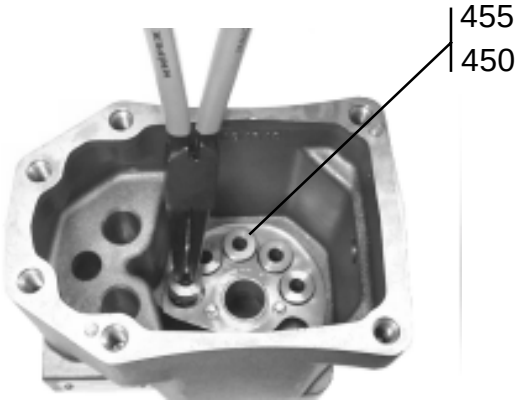


3. Install the other Shaft Seal (item 233).

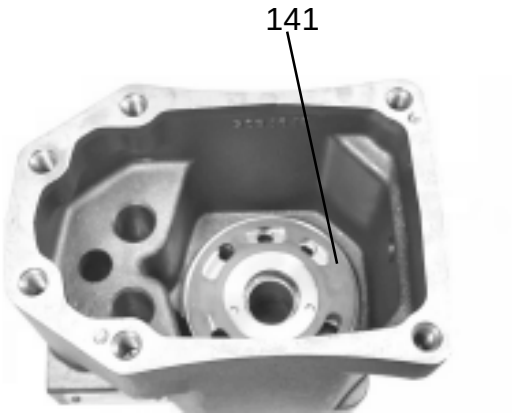
4. Install the Seal Carrier (item 231) on the shaft.



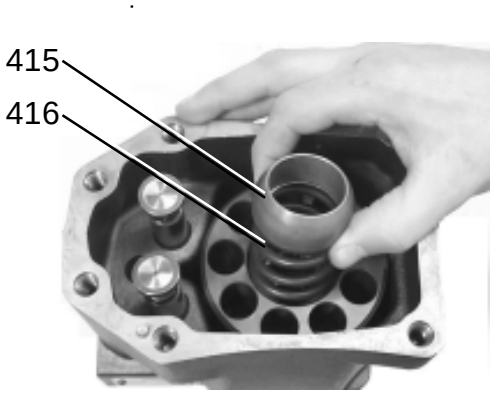
5. Install the O-ring (item 225) in the Bearing Housing (item 211). Install the Shaft with Seal Carrier in the Bearing Housing (item 211). Place the Bearing Housing on a tube (inside diameter 65mm and outside diameter max 80mm) and press down the Shaft with Seal Carrier. Press on the seal carrier and make sure that the lubrication holes are opposite eachother.



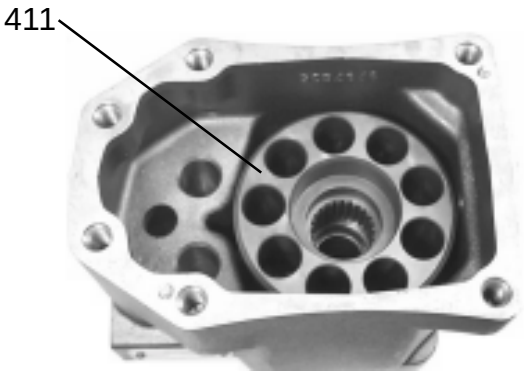
6. Install the Compression Springs (item 455) and the Bushes (item 450).



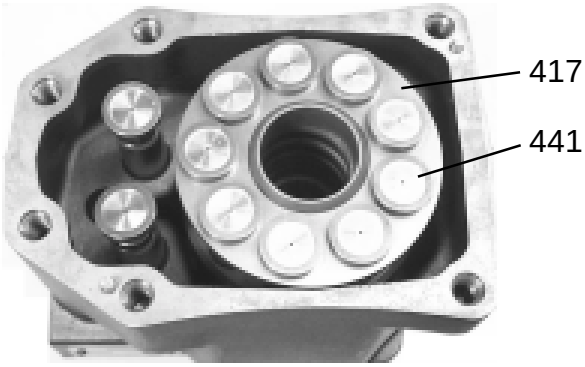
7. Install the Valve Plate (item 141).



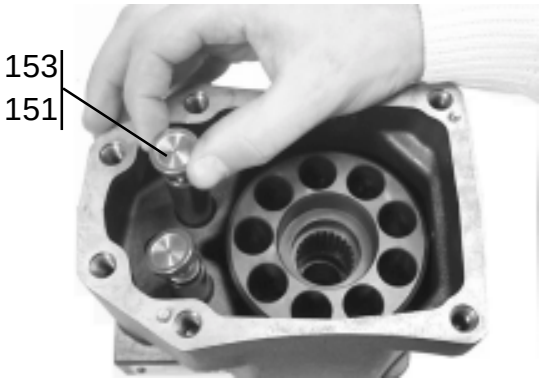
10. Install the Compression Spring (item 416) and the Ball (item 415).



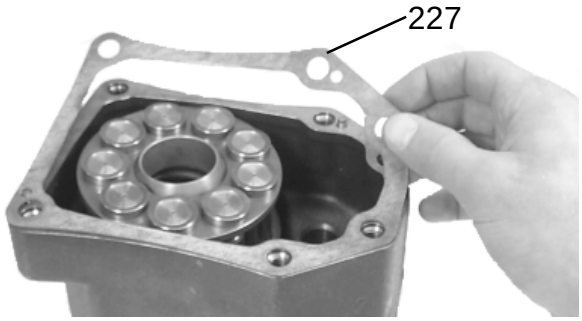
8. Install the Cylinder Barrel (item 411).



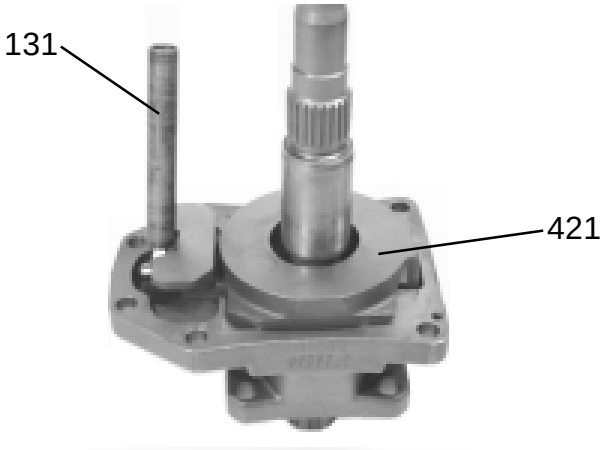
11. Install the Plate (item 417) with Pistons (item 441).



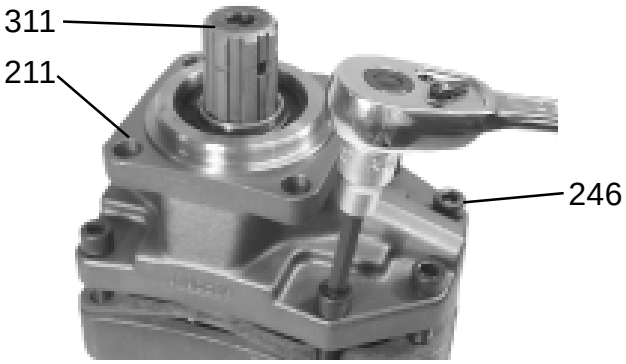
9. Install the Compression Springs (item 153) and the Setting Pistons (item 151).



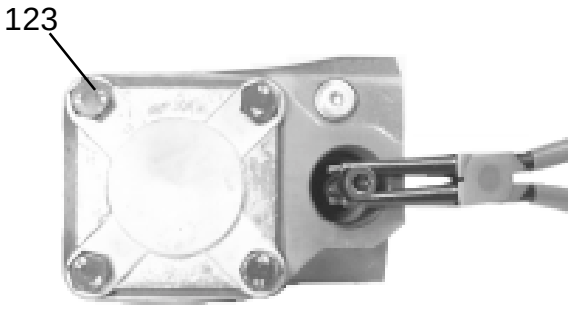
12. Install the Gasket (item 227).
Note! Use a new Gasket.



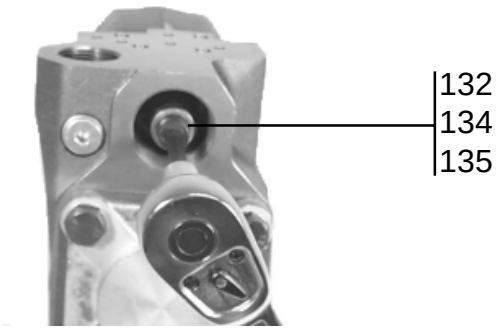
13. Install the Swashplate (item 421) and the Bar Assy (item 131).



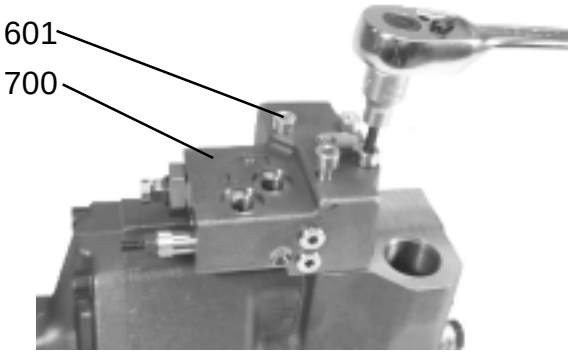
14. Install the Shaft (item 311), Bearing Housing (item 211), Swashplate (item 421) and Bar Assy (item 131). Hold the Swashplate against the Bearing Housing until the Splines on the Shaft enters the splines on the Cylinder Barrel. Assembly the Hex S Screws (item 246) according to the specified tightening torque 60±10Nm. ”Note, to facilitate assembly use two longer screws and push the parts together until you can fit the original screws”.



15. Pull out the Bar (item 131) with a long screw.



16. Install the Hex S Screw (item 135) together with the Washer (item 134) and the Compression Spring (item 132) according to the specified tightening torque 30±5Nm.



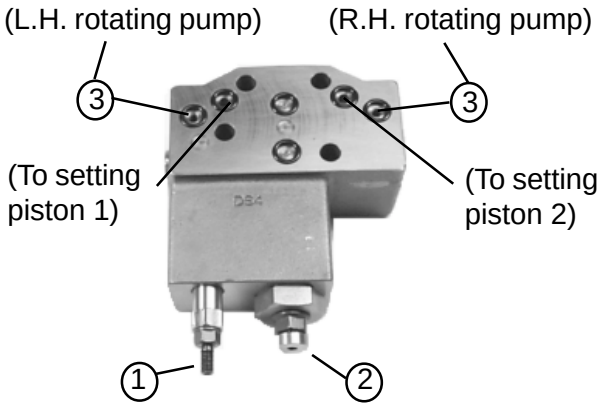
17. Install the LS Control (item 700). Tighten the screws (item 601) to the specified tightening torque 24±5Nm.

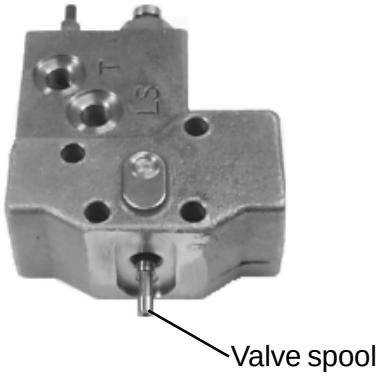
Note! If the Cover (item 121) is removed, install the Cover with a new Gasket (item 122) and the Screws (item 123) according to the specified tightening torque 60±10Nm.

Tightening Torques

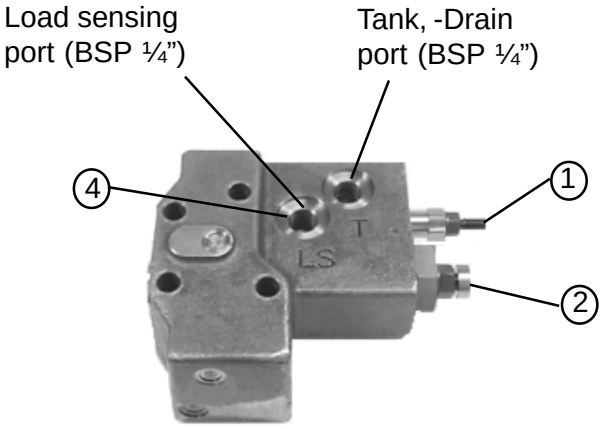
Item	Tightening Torque	
246	60 ± 10	Nm
135	30 ± 5	Nm
123	60 ± 10	Nm
601	24 ± 5	Nm

LS Control

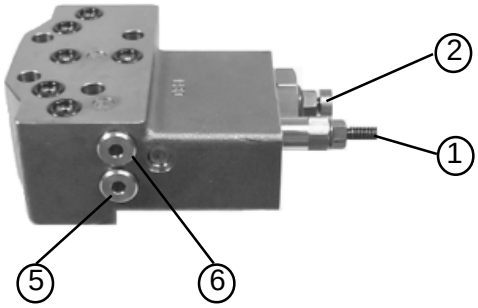




1. Signal pressure limiter adjustment
2. Differential pressure adjustment
3. System pressure dampening nozzle (2.0 mm)



4. Load sensing orifice (1.0 mm; fixed)



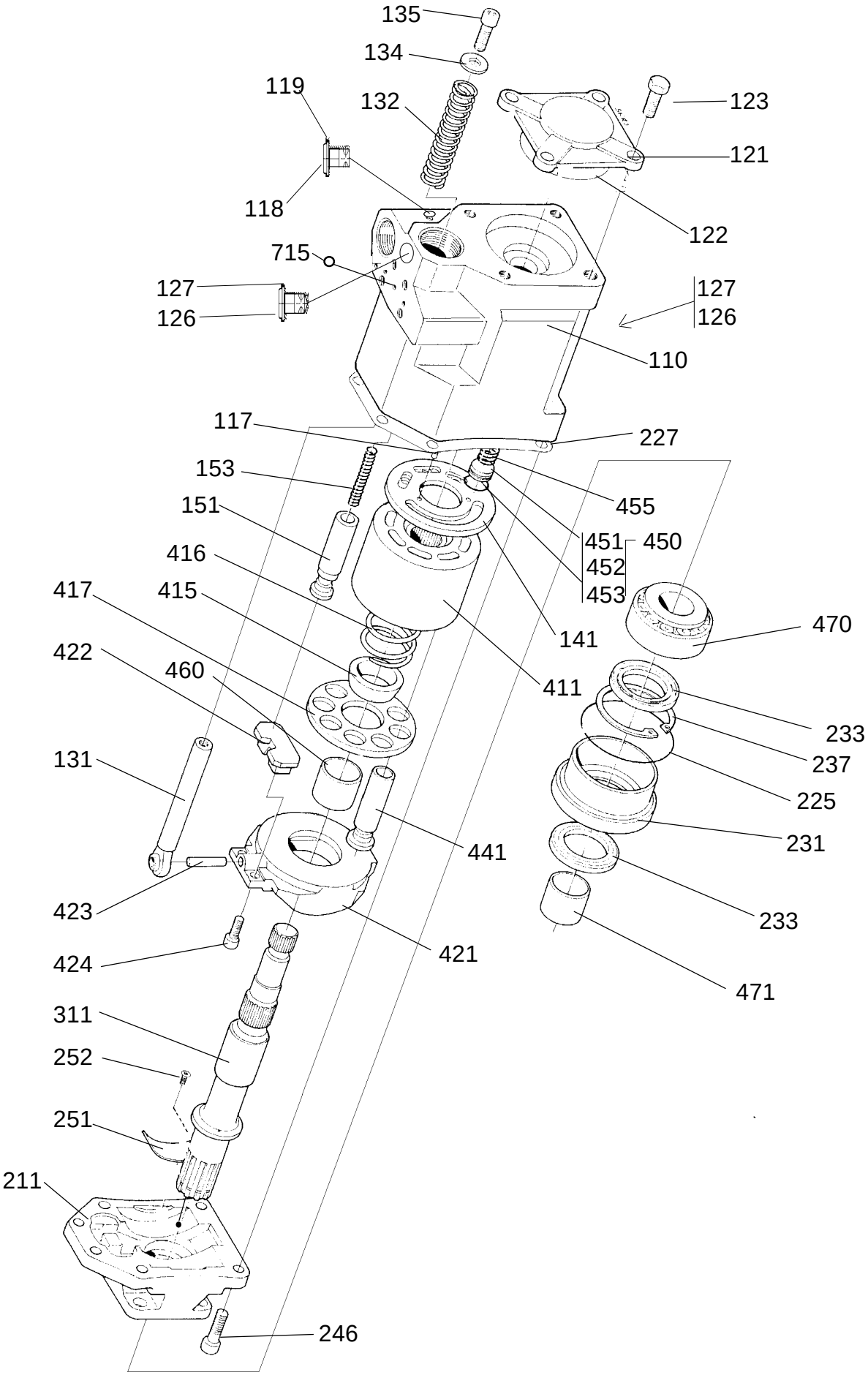
5. Return line nozzle (0.6 mm)
6. Bleed-off nozzle (0.6 mm)

LS control adjustments

LS signal pressure limiter
The cartridge is factory set at 275 bar but is adjust-able to 350 bar.

LS load sensing valve
From factory, the Dp (stand by pressure) is set to 25 bar but is adjustable between 20 - 35 bar.
The 25 bar setting and the standard orifice sizes will usually provide an acceptable directional valve characteristic as well as system stability.
For additional information, contact Mobile Controls Division.

Splitview


135
134
119
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715
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131
225
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441
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424
471
311
252
251
211
246

Parts specification

Item	Description
110	Barrel Housing
117	Guide Pin
118	Hex Socket Plug
119	Seal Washer
121	Cover
122	O-ring
123	Hexagon Screw
126	Hex Socket Plug
127	Seal Washer
131	Bar Assy
132	Compression Spring
134	Washer
135	Hex Socket Screw
141	Valve Plate
151	Piston Assy
153	Compression Spring
211	Bearing Housing
225	O-ring
227	Gasket
231	Seal Carrier
233	Shaft Seal
237	Retaining Ring
246	Hex Socket Screw
251	Bearing Cap
252	Sunk Head Screw
311	Shaft
411	Cylinder Barrel
415	Ball
416	Compression Spring
417	Plate
420	Swashplate Assy
441	Piston Assy
451	Bush
452	Piston Seal
453	X-ring
455	Compression Spring
460	Plain Bearing
470	Tappered Roller Bearing
471	Inner Ring

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